Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CNSC SAFETY FROM ALL ANGLES

CANADIAN NUCLEAR SAFETY COMMISSION

ANNUAL REPORT 2012–2013

Canada

The Canadian Nuclear Safety Commission regulates all nuclear facilities and activities in Canada – from uranium mining to power generation, nuclear research, nuclear facilities and prescribed equipment, industrial and medical applications of nuclear materials, and waste disposal.

We strive to ensure that Canadian nuclear activities are among the safest and most secure in the world.

As leaders in our field, we are experts with a strong focus on action: We enforce our very strict regulatory requirements and vigilantly monitor licensees to verify they are following the rules.

We regulate the nuclear industry in Canada from all angles to keep Canada and Canadians safe.

LETTER TO THE MINISTER

The Honourable Joe Oliver
Minister of Natural Resources
Ottawa, Ontario

Sir:

I have the honour of presenting to you the Annual Report of the Canadian Nuclear Safety Commission for the fiscal year ending March 31, 2013. The report has been prepared and is submitted in accordance with Section 72 of the *Nuclear Safety and Control Act*.

M. Binder

Michael Binder
President and Chief Executive Officer, Canadian Nuclear Safety Commission

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MESSAGE FROM THE PRESIDENT

It is my honour to present the Canadian Nuclear Safety Commission (CNSC) Annual Report for 2012–13. This is my sixth annual report since becoming President of the CNSC. This year's theme of **Safety From All Angles** represents the all-encompassing approach the CNSC takes to ensure a safe nuclear industry in Canada and the protection of people and the environment.

This past year has seen some significant legislative and regulatory changes in our oversight of the Canadian nuclear industry. The Parliament of Canada amended the *Nuclear Safety and Control Act* (NSCA) – giving the CNSC authority to create an administrative monetary penalties system for persons and corporations who violate regulatory requirements. In addition, the CNSC will continue to use other means of enforcement to address instances of non-compliance to ensure that the necessary corrective actions are taken.

The new *Canadian Environmental Assessment Act, 2012* (CEAA 2012) also came into effect this past year and established the CNSC as one of only three agencies to perform federal environmental assessments. Under the CEAA 2012, the CNSC was given sole responsibility for all environmental assessments of all nuclear projects in Canada. In order to ensure that nuclear undertakings continue to be effectively assessed, the CNSC has formalized its practices under a new Environmental Protection Assessment (EPA) process, which allows for increased opportunities for public participation and the continued stringent analysis of potential environmental impacts and implementation of appropriate mitigation measures under the NSCA.

This past January, amendments to the *Class I Nuclear Facilities Regulations* and the *Uranium Mines and Mills Regulations* were published. They establish 24-month timelines for major nuclear projects that require the CNSC's regulatory review and a first Commission decision for licensing. The timelines are based on the CNSC's current regulatory review process and provide more predictable timing of regulatory reviews for new nuclear projects.

The CNSC completed the first phase of its four-year Action Plan which identified the measures required of licensees, CNSC staff, and external jurisdictions for discharging each recommendation of the Fukushima Task Force Report. In August 2011, I established the External Advisory Committee (EAC) – a committee of independent experts mandated to assess the CNSC's processes and responses in light of lessons learned from the Fukushima nuclear incident. The Committee delivered its findings to me in April 2012. I am pleased to report that the EAC found that the CNSC acted appropriately in its response to the Fukushima crisis.

The CNSC continued to provide significant support to two Joint Review Panels established to review the environmental impacts of proposed nuclear projects. In May 2012, the Government of Canada accepted the recommendations made in the Environmental

Assessment Report of the Joint Review Panel (JRP) for the Darlington New Nuclear Power Plant Project. In August 2012, the JRP announced its decision to issue Ontario Power Generation (OPG) a licence to prepare a site for a nuclear power reactor. In January 2012, a Joint Review Panel was announced to review OPG's plan to build and operate a Deep Geologic Repository (DGR) for the long term storage of low- and intermediate-level radioactive waste in Ontario. The CNSC has been providing technical and research assistance as the DGR Joint Review Panel conducts its complex work.

The Commission continued its work this past year of making decisions on the licensing of major nuclear related activities. Some of the public hearings leading to these decisions received wide participation by intervenors wishing to make their views known to the Commission. Public participation was especially significant for the public hearing regarding the proposal by OPG to refurbish and continue operating the Darlington Nuclear Station as well as the public hearing to issue a uranium mine site preparation and construction licence to Strateco Resources Inc. for the Matoush underground exploration project in Northern Québec.

In September 2012, the Government of Québec announced the shutdown of the Gentilly-2 nuclear power plant in Bécancour, Québec. The CNSC has begun planning for reduced regulatory oversight of that nuclear power plant for the years to come. A protocol was signed with Hydro Québec in January 2013 to clarify regulatory expectations going forward. Our overarching priority to ensure the safe use of nuclear energy and materials in Canada will not change.

Through its work and adherence to standards, the CNSC continues to serve Canadians and deliver on its primary commitment: that we will never compromise safety.

M. Binder

Michael Binder

CANADIAN NUCLEAR SAFETY COMMISSION OVERVIEW

VISION

To be the best nuclear regulator in the world

MISSION

To regulate nuclear activities to protect the health, safety and security of Canadians and the environment, and to implement Canada's international commitments on the peaceful use of nuclear energy

The CNSC's headquarters are in Ottawa and we have offices at each of Canada's five power reactor sites, a site office at Chalk River Laboratories and four regional offices across the country.

A REGULATORY AND OVERSIGHT ROLE

Under the NSCA, the CNSC licenses, regulates and establishes technical requirements for all nuclear-related activities in Canada. All those wishing to carry out nuclear related activities – including activities related to the design of nuclear facilities and prescribed equipment, the construction, operation, decommissioning and abandonment of nuclear facilities, and the production, possession and use of nuclear substances – must first obtain a licence from the CNSC. We provide clarity on regulatory expectations, and we oversee licensed activities to ensure our regulatory requirements are met.

The Commission is the CNSC's decision-making body and makes licensing decisions for all major nuclear facilities in Canada.

Our staff participate in many national and international technical projects and meetings to contribute to the safe and secure regulation of nuclear facilities and activities here in Canada and around the world. These projects and meetings address areas ranging from the design of new nuclear reactors, aging facilities and decommissioning practices to the effects of radiation on people and the environment, and nuclear non-proliferation activities.

The CNSC's Audit Committee, with three external and two internal members, reinforces the effectiveness of internal audits. It oversees key areas and processes such as risk management, management control, accountability reporting, and values and ethics.

The CNSC's Evaluation Committee is also an essential component of the organization's governance structure. It serves as an advisory body to the President on the CNSC's evaluation plan, resourcing and final evaluation reports.

A MANDATE TO ENSURE SAFETY

The CNSC uses risk-informed regulatory approaches to plan and carry out licensing and compliance activities, in order to establish appropriate regulatory control that is commensurate with the activities and the risk involved.

All major Canadian nuclear facilities are designed and operated with the "defence-in-depth" principle in mind. The CNSC requires licensees to implement multiple layers of defence in safety systems and programs, in order to keep facilities and workers safe and to minimize consequences should a severe accident happen. The CNSC's strict oversight, which includes onsite inspections, ensures licensees are operating safely and adhering to their licence conditions.

A FOCUS ON SAFETY AND PREPAREDNESS

The NSCA requires all licensees to demonstrate to the CNSC that their workers and management are fully trained to carry out their duties competently. The CNSC also requires all nuclear facilities to have comprehensive emergency programs. The organization works with nuclear operators, federal and provincial government agencies, municipalities, first responders and international organizations, to be ready to respond to a nuclear emergency at any time.

In the event of an emergency involving a nuclear facility or nuclear substances, the CNSC operates a full Emergency Operations Centre as part of the Government of Canada's response. The public and licensees can also call a CNSC Duty Officer, available 24 hours and 7 days a week, to report actual or potential incidents. The Duty Officer will initiate prompt regulatory responses to ensure all appropriate measures are taken to protect people and the environment.

FOSTERING AN INTERNAL SAFETY CULTURE

The CNSC has a strong safety culture derived from its organizational mission, programs and practices, along with employee and management actions and behaviours, which establish safety as an overriding priority. For the CNSC, this means embedding safety into everything we do and having the same focus on safety that we expect of our licensees.

Barclay Howden, Director General, Directorate of Regulatory Improvement and Major Projects Management, speaks to members of the CNSC staff on corporate improvement initiatives.

Spotlight Story

Continuous Improvement to Our Regulatory Framework

The CNSC has the mandate to protect the health, safety and security of Canadians, and its regulatory framework sets strict requirements for nuclear licence applications and approvals. This framework consists of laws passed by Parliament that govern how Canada's nuclear industry is to be regulated, as well as regulations, licences and other documents that the CNSC uses in carrying out its duties as a regulator.

The CNSC made several changes in 2012–13 to its regulatory framework as part of ongoing efforts to ensure its regulatory requirements remain up-to-date and responsive to the needs of Canadians, licensees and industry. These changes also reflect adaptations made to legislation as well as the Government of Canada's agenda for regulatory reform.

RESPONSIBLE RESOURCE DEVELOPMENT

In 2012, the Government of Canada passed the *Jobs, Growth and Long-term Prosperity Act*, which included key elements of the Government's Responsible Resource Development initiative. This initiative is designed to create jobs and economic growth by streamlining the regulatory process for major energy and resource projects, while strengthening Canada's protection of the environment.

One of the more significant changes to the NSCA made under the Responsible Resource Development initiative calls for the CNSC to develop and implement administrative monetary penalties for violations of regulatory requirements stated in the NSCA, regulations or their licences. Amendments to the NSCA will require the CNSC to establish, in regulation, a list of potential violations and how it will determine the amount of associated penalties. (see spotlight story on page 39).

Meanwhile, the CNSC's regulated timelines came into force in January 2013. These new timelines give 24 months to complete projects that need the CNSC's regulatory review and a Commission decision for two types of licences: a licence to prepare a site for a Class I nuclear facility, and a combined licence to prepare a site for and construct a uranium mine and mill. These changes provide more predictable timing for reviewing licence applications – while continuing to protect the health, safety and security of Canadians and the environment.

The CNSC continues to collaborate with other government departments to coordinate regulatory review processes for major nuclear projects such as the Darlington new-build project, the DGR for low- and intermediate-level waste, and the proposed new Millennium uranium mine in Saskatchewan.

REDUCING RED TAPE

In 2012–13, the Government of Canada continued to implement its Red Tape Reduction Action Plan. The plan is intended to simplify regulations, avoid duplication and reduce regulatory burden for business wherever possible. In response, the CNSC updated its Web site to provide more information on its plans for developing and amending regulations, as well as service standards for high-volume licence activities. In addition, the CNSC moved forward on positioning itself to respond to new federal requirements to reduce regulatory burden, particularly for small businesses, as set out in the government's "one-for-one" rule and "small business lens".

REGULATORY DOCUMENTS AND DISCUSSION PAPERS

In 2012–13, the CNSC continued to update and modernize its regulatory documents and to seek early views from stakeholders on certain regulatory initiatives by publishing discussion papers. This work on regulatory documents is part of the CNSC's continuous effort to clarify to licensees and applicants how they can best meet the requirements of the NSCA. Discussion papers play an important role in soliciting public input on CNSC policies and approaches, underscoring the CNSC's commitment to a transparent consultation process. They also help streamline document development and publishing by soliciting public input early in the drafting process.

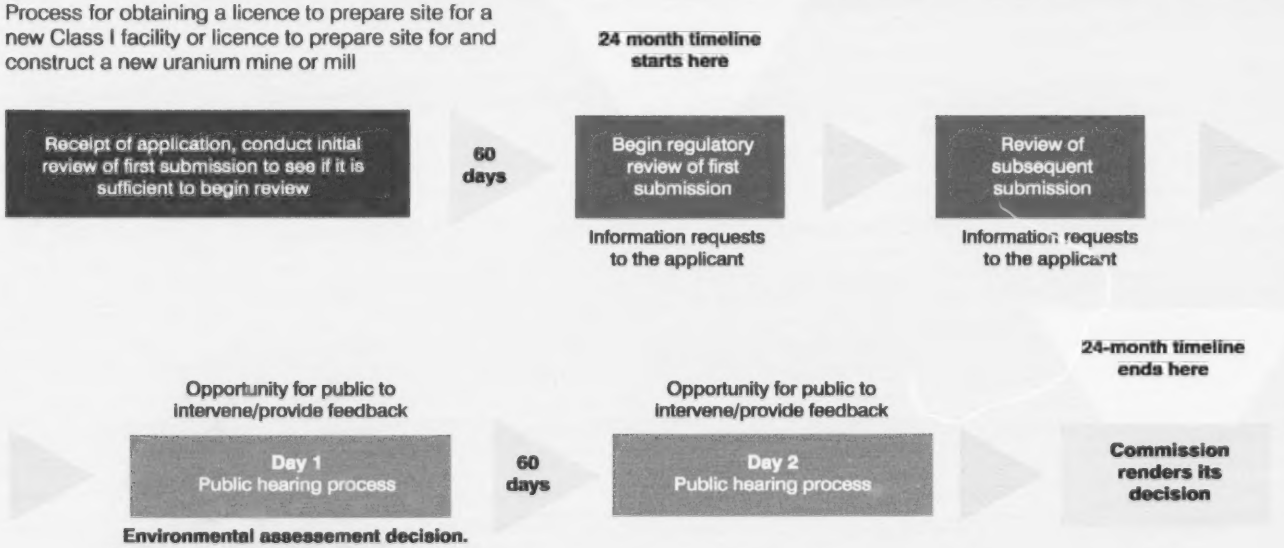
See Annex B on page 62 for more information on regulatory changes that occurred in 2012–13.

A COMMITMENT TO TRANSPARENCY AND ENGAGEMENT

In its ongoing commitment to transparency and engaging with the public, licensees and interested organizations, the CNSC consults regularly with Canadians as it develops tools within its regulatory framework. We welcome public input on draft documents that are open to consultation, review all such input and post the comments received on our Web site for feedback. We then prepare consultation reports that summarize the feedback.

The CNSC's *Regulatory Framework Plan 2012–18* sets out the regulations and regulatory documents that are planned for development or amendment. In 2012–13, the framework continued to be modernized, as detailed in the CNSC's new Regulatory Framework Plan. Aligned with the CNSC's corporate priorities, this plan also considers current developments in the nuclear environment, and is reviewed four times a year and adjusted as necessary.

THE NEW 24-MONTH TIMELINE FOR REGULATED TIMELINES


Process for obtaining a licence to prepare site for a new Class I facility or licence to prepare site for and construct a new uranium mine or mill
24 month timeline starts here
Receipt of application, conduct initial review of first submission to see if it is sufficient to begin review
60 days
Begin regulatory review of first submission
Information requests to the applicant
Review of subsequent submission
Information requests to the applicant
24-month timeline ends here
Opportunity for public to intervene/provide feedback
Day 1
Public hearing process
60 days
Opportunity for public to intervene/provide feedback
Day 2
Public hearing process
Commission renders its decision
Environmental assessment decision.
It is a prerequisite for the licensing decision.

KEY ACHIEVEMENTS
A Year of Change

2012–13 was a year that brought several changes to the CNSC. The NSCA was amended by Parliament. Two existing regulations under the Act were amended and one new regulation was created. The *Canadian Environmental Assessment Act* was also repealed and replaced by the *Canadian Environmental Assessment Act, 2012* (CEAA 2012).

PARLIAMENT AMENDS THE *NUCLEAR SAFETY AND CONTROL ACT*

In 2012, the Parliament of Canada passed the *Jobs, Growth and Long-term Prosperity Act*, which amended the NSCA – giving the CNSC authority to create an administrative monetary penalties system for persons and corporations who violate regulatory requirements. The system will be established in a new set of regulations that are expected to come into force in July 2013.

TIMELINES FOR MAJOR LICENSING DECISIONS SET BY REGULATION

In January 2013, amendments to the *Class I Nuclear Facilities Regulations* and the *Uranium Mines and Mills Regulations* were published. They establish 24 month timelines for projects that require the CNSC's regulatory review and a Commission decision, for new licence applications to prepare a site for a Class I nuclear facility, or a combined licence to prepare a site and construct a uranium mine and mill. The timelines, based on the CNSC's current regulatory review process, provide more predictable timing of regulatory reviews of applications for licences for new nuclear projects, while continuing to protect the health, safety and security of Canadians and the environment.

NEW GUIDELINES FOR ENVIRONMENTAL ASSESSMENTS

In July 2012, the new CEAA 2012 came into effect and brought changes to the types of nuclear projects or undertakings that require an environmental assessment under the Act, focusing on very large and complex projects. In order to ensure continued effective assessments of nuclear undertakings, the CNSC has combined the work done under the former legislation and formalized it under a new Environmental Protection Assessment (EPA) process, which allows stringent analysis of potential environmental impacts and the implementation of appropriate mitigation measures under the NSCA. The CNSC's EPA process is conducted efficiently as part of the licence application review process for projects with a high level of interest from the public or Aboriginal groups, or a high possibility of adverse effects on the environment.

CORE WORK

Our staff continued to let their expertise, leadership and knowledge shine through their work under our "Core + Four" framework, which outlines our way of doing business and represents the cornerstone of our commitment to being the best nuclear regulator in the world.

Launched in 2009, the Core + Four is an overall framework that guides our work. It consolidates organizational priorities under five headings: Core work, Commitment to ongoing improvements, Clarity of our requirements, Capacity for action, and Communication. This year, significant progress was made in each of these priority areas.

LICENSING OF MAJOR NUCLEAR FACILITIES

During 2012–13, the Commission held 10 public hearings with a total of 1088 intervenors, and conducted 21 abridged hearings.

In May 2012, the Government of Canada accepted the recommendations made in the Environmental Assessment Report of the Joint Review Panel (JRP)

for the Darlington New Nuclear Power Plant Project. The JRP concluded that the project is not likely to cause significant adverse environmental effects, provided the mitigation measures proposed and commitments made by Ontario OPG during the review and the Panel's recommendations are implemented.

In August 2012, the JRP announced its decision to issue OPG a licence to prepare a site for a nuclear power reactor for the Darlington nuclear power plant project. The licence is valid for 10 years, to August 2022. In September 2012, the decision was challenged by way of application for judicial review in the Federal Court. A hearing of the matter, along with the hearing of an application for judicial review of the environmental assessment undertaken respecting the new Darlington nuclear power project, is scheduled for November 2013.

COMPREHENSIVE OVERSIGHT

In 2012–13, the CNSC carried out close to 2,000 inspections relative to the 3,300 licences held by just over 2,500 licensees. As well, 793 export licences (202 of which were issued for risk-significant radioactive sources) and 135 import licences were issued in accordance with requirements defined in the *Nuclear Non-Proliferation Import and Export Control Regulations.* Under export licences issued by the CNSC, Canadian companies safely exported in excess of 13,000 metric tons of uranium and just under 14,000 radioactive sources.

In terms of other regulatory actions, there were 2 orders issued to nuclear cycle facilities as well as 21 orders issued to specific licensees using nuclear substances. These latter orders were typically for the licensee to cease using a nuclear related device until it had complied with CNSC requirements. One exposure device operator was also decertified.

Key safety-related positions at nuclear facilities and facilities that use nuclear-related equipment must be occupied by personnel who have been certified by the CNSC as qualified, trained and capable of performing their duties. These include: key operating personnel for both power and research reactors; health physicists and radiation safety officers; and exposure device operators (operators of industrial radiography equipment). On March 31, 2013, there were 6,350 valid CNSC certifications held by persons across Canada.

FUKUSHIMA EFFORTS CONTINUE WITH THE CNSC ACTION PLAN

In 2012–13, the CNSC completed the first phase of its four-year Action Plan, which identified the measures required of licensees, CNSC staff, and external jurisdictions for discharging each recommendation of the *Fukushima Task Force Report.* The CNSC Action Plan was presented to the Commission at a public meeting in May 2012, and the public and stakeholders were invited to provide written comments.

In April 2012, the External Advisory Committee (EAC) – a committee of independent experts that was established in August 2011 to assess the CNSC's processes and responses in light of lessons learned from the Fukushima nuclear incident – delivered its report to CNSC President Michael Binder. In general, the EAC found that the CNSC acted appropriately in its response to the Fukushima crisis. The Committee also made a series of nine recommendations, which were incorporated into the comprehensive *CNSC Staff Action Plan on the CNSC Fukushima Task Force Recommendations.*

THE CNSC FUKUSHIMA TASK FORCE REPORT CONCLUDED THAT:

Canadian nuclear power plants are safe

the Canadian nuclear regulatory framework is strong

emergency preparedness and response measures are adequate in Canada

the threat of a major earthquake at Canadian nuclear power plants is negligible

Canadian nuclear power plants have been operating safely for more than 40 years

WORK ON WASTE REPOSITORY PROJECTS CONTINUES

Two long-term radioactive waste management initiatives, which may result in geological repositories, are underway in Canada.

First, OPG has proposed the DGR project for storing low- and intermediate-level radioactive waste over the long term. The DGR Joint Review Panel, which was appointed to examine the environmental assessment and licence application, is preparing to hold public hearings in fall 2013 (see spotlight story on page 44). Both CNSC staff and OPG will appear before the panel.

Second, since 2010, Canada's Nuclear Waste Management Organization (NWMO) has consulted with Canadians to identify an informed community willing to host a geological repository for used nuclear fuel in Canada. These consultations are part of the NWMO's Adaptive Phased Management (APM) project.

As a best practice, the CNSC engages early in proposed new nuclear projects to ensure that licence applicants and affected communities have a comprehensive understanding of its role in regulating Canada's nuclear sector.

In 2012–13, the CNSC met with 16 of the 21 communities involved in the NWMO's APM Project: Blind River, Ontario; Creighton, Saskatchewan; Ear Falls, Ontario; Elliot Lake, Ontario; English River First Nation, Saskatchewan; Hornepayne, Ontario; Huron-Kinloss, Ontario; Ignace, Ontario; Manitouwadge, Ontario; Nipigon, Ontario; Pinehouse, Saskatchewan; Saugeen Shores, Ontario; Schreiber, Ontario; South Bruce, Ontario; Spanish, Ontario; and The North Shore, Ontario.

The exchange of information touched on various issues, including participation in the Commission public hearing process, Aboriginal consultation, environmental assessment and the licensing process, public information programs, geotechnical aspects of a DGR, and the transportation and safety of used nuclear fuel. The CNSC also took the opportunity to emphasize its neutral role as an independent body concerned solely with nuclear safety and with no part in promoting nuclear energy.

INTERNATIONAL CONFERENCE ON NUCLEAR SAFETY HELD IN OTTAWA

In early April 2013, the CNSC, on behalf of the Government of Canada, hosted the International Atomic Energy Agency (IAEA) International Conference on Effective Nuclear Regulatory Systems. A great amount of work was done in 2012–13 to organize this event. The conference touched on many critically important subjects, given the events in Fukushima, Japan in 2011. Attendees included 275 participants from 55 countries and various international organizations.

Key action items resulting from the conference included:

- continuous improvement of regulatory systems
- development of "regulatory operating experience programs"
- a requirement for national action plans and follow-up peer review missions
- safety reviews of used nuclear fuel in pools
- development and testing of national communication plans
- implementation of a culture of accountability

RESEARCH AND SUPPORT PROGRAM – KNOWLEDGE TO SUPPORT OUR WORK

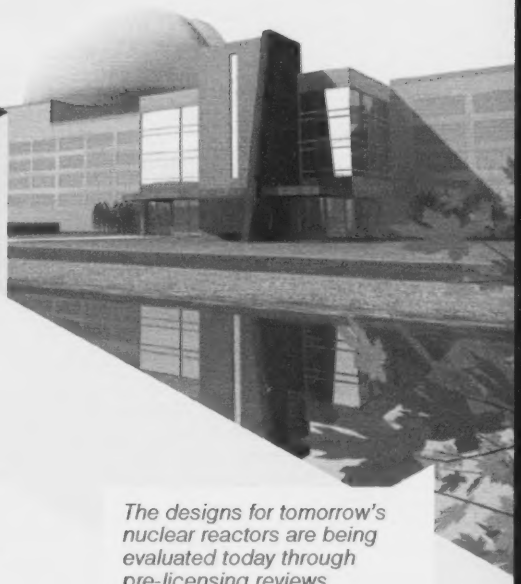
The CNSC's Research and Support Program aims to generate knowledge and information to support the CNSC staff in its regulatory activities. It provides access to independent advice, expertise, experience and information through contracts, grants, and contributions placed in the private sector or with other national or international agencies and organizations.

In 2012–13, $2.53 million was spent to support 36 projects, and $1.34 million went to support 29 grants and contributions. Of these, 10 projects delivered final reports and 10 grants and contributions were completed; the remaining projects and contributions will continue in 2013–14.

The program underwent a significant change this past year to align research needs to the CNSC's safety and control areas. The following eight safety and control areas have identified research needs: human performance management, safety analysis, physical design, fitness for service, radiation protection, environmental protection, waste management, and safeguards and non-proliferation.

Spotlight Story

Pre-licensing Reviews Support Design Goals of Vendors in the Nuclear Industry



The designs for tomorrow's nuclear reactors are being evaluated today through pre-licensing reviews.

In 2012–13, the CNSC continued to provide optional pre-licensing reviews for nuclear reactor vendors. A pre-licensing review is a service that takes place at the vendor's request, with the goal of adding regulatory confidence about design and process before an applicant submits a licence application to the CNSC.

First, a pre-licensing review can help determine if a vendor is going in the right direction with respect to design and safety, and that the design complies with the requirements stated in the CNSC's regulatory document *Design of New Nuclear Power Plants*. Second, a pre-licensing review can provide a vendor with an indication that its technology has the potential to be licensed successfully. Third, a review gives vendors experience working within Canada's nuclear regulatory review, which is amongst the most thorough in the world. Finally, a pre-licensing review can help establish ways to resolve any design issues that may come up in future licensing.

A REVIEW IS NOT A FORMAL CERTIFICATION

A pre-licensing review does not involve issuing a licence or a certification under the NSCA. Moreover, it does not in any way bind or influence future decisions by the Commission, which has the authority to issue licences for nuclear power plants and small reactors.

A REVIEW TAKES PLACE IN THREE PHASES:

- Phase 1 involves an overall assessment of the vendor's nuclear power plant design against the most recent CNSC design requirements for new nuclear power plants in Canada.
- Phase 2 goes into more detail, identifying any potential barriers to licensing the vendor's nuclear power plant design in Canada.
- Phase 3 is a follow-up period. During this phase, the vendor may ask the CNSC to provide more information about a Phase 2 topic or to review its activities toward preparing the reactor's design for licensing.

PRE-LICENSING REVIEWS FOR 2012–13:

1. Candu Energy Inc.: EC 6 (Enhanced CANDU) in Phase 3 follow-up, to be completed in 2013
2. AIMEA: AIMEA 1 in Phase 1, to be completed early 2013
3. Babcock & Wilcox: mPower in Phase 1, to be completed late 2013
4. Westinghouse: AP-1000 in Phase 2, to be completed mid-2013

THE 4 Cs: GUIDING PRINCIPLES FOR OUR WORK

1 COMMITMENT TO ONGOING IMPROVEMENTS

In 2012–13, the CNSC continued its work to implement the action plan developed in response to the Fukushima Daiichi accident in March 2011. The four year action plan was designed specifically for Canada's nuclear power plants and the Atomic Energy of Canada Limited (AECL) Chalk River facility, and includes measures to reinforce defences and minimize risk; strengthen emergency preparedness; improve the Canadian nuclear regulatory framework; and enhance the CNSC's ability to communicate during an emergency.

The CNSC completed all follow-up actions this past year resulting from the Integrated Regulatory Review Service (IRRS) mission conducted in 2009. The IRRS is one of the services offered to member states by the International Atomic Energy Agency. The purpose of an IRRS mission is to compare the regulatory practices of a country with international standards and equivalent good practices elsewhere in the world.

The CNSC continued to implement its Licence Reform project this past year, and started to apply the new licensing format to uranium mines and mills. Class I facilities (nuclear power plants, fuel fabrication and conversion facilities) are already subject to the new licence format.

The new licences provide licence conditions that are clear, measurable, defensible and enforceable. Included also is a Licence Conditions Handbook, which consolidates into a single document the criteria that will be used to verify compliance with the licence, as well as interpretations and administrative control of licence conditions.

2 CLARITY OF REGULATORY REQUIREMENTS

In 2012, the Government of Canada passed the *Jobs, Growth and Long-term Prosperity Act*. The Act made amendments to the NSCA, mandating the CNSC to establish an administrative monetary penalties system as one of several enforcement tools that may be used when persons and companies do not comply with the CNSC's regulatory requirements.

In January 2013, amendments to the *Class I Nuclear Facilities Regulations* and the *Uranium Mines and Mills Regulations* were published. They establish 24-month timelines for projects that require the CNSC's regulatory review and a Commission decision, for new licence applications to prepare a site for a Class I nuclear facility or a combined licence to prepare a site and construct a uranium mine and mill. The timelines, based on the CNSC's current

regulatory review process, provide more predictable timing of regulatory reviews of applications for licences for new nuclear projects, while continuing to protect the health, safety and security of Canadians and the environment.

In 2012–13, the CNSC published several regulatory documents related to vendor design reviews, licence applications for accelerators used in nuclear medicine, reliability programs for nuclear power plants, and maintenance programs for nuclear power plants.

Two other regulatory documents related to site access security clearances for high-security sites and the security of nuclear substances were approved for publication by the Commission. In addition, the CNSC published discussion papers on the following topics: proposals for regulations, with respect to regulated timelines; amendments to the *Packaging and Transport of Nuclear Substance Regulations*; administrative monetary penalties; proposals related to alcohol and drug programs and testing; and safety culture.

3 CAPACITY FOR ACTION

The shutdown of the Gentilly-2 nuclear power plant in Bécancour, Québec, in December 2012 and the Government of Canada's Deficit Reduction Action plan will have an impact on our budget in the next fiscal year (2013–14). In response, we will be reducing our workforce by 20 full-time positions in 2013–14 and by another 20 positions in 2014–15. Every effort will be made to manage these planned reductions through attrition, where possible. Given that we are Canada's nuclear regulatory organization, our workforce is unique, and we aim to retain employees with skills in critical areas.

The CNSC is taking an integrated approach to reviewing its resources, without compromising safety. Our overarching priority to ensure the safe use of nuclear energy and materials in Canada will not change.

4 COMMUNICATIONS

In February 2012, we launched our English and French Facebook pages, and in 2012–13, we expanded our online communications by creating our YouTube channel with original content and by making use of webinars to improve our dialogue with licensees. We have been continuously adding new information to our web site and expanding our list of email subscribers. We are continuing to produce and release content for CNSC Online, an interactive presentation that explains virtually all aspects of our work.

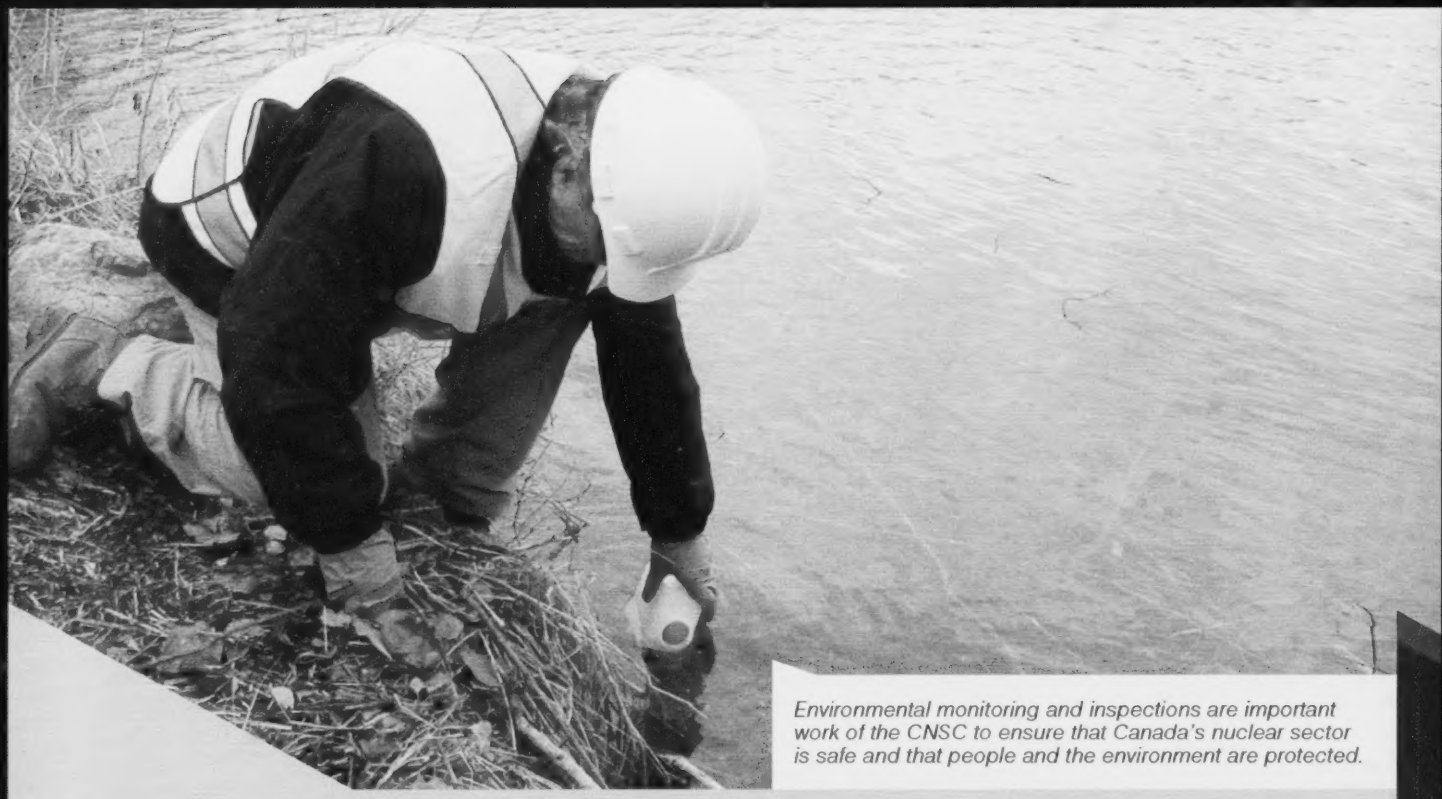
This has been another active year for "CNSC 101", a traveling information and educational program on how Canada's nuclear regulator provides oversight to ensure the safety and security of the nuclear sector and its activities. CNSC 101 held eight sessions in six locations across the country: Iqaluit, Nunavut; Ottawa, Ontario; Kincardine, Ontario; Saugeen Shores, Ontario; Toronto, Ontario; and Vancouver, British Columbia. At these free information sessions, participants met CNSC experts and learned more about the CNSC's history and mandate as well as how the Commission makes independent decisions on the licensing of major nuclear facilities and activities in Canadian communities. With high satisfaction rates from those attending these interactive sessions, the CNSC will continue to offer CNSC 101 in 2013–14. Upcoming sessions are posted at nuclearsafety.gc.ca and on Facebook.

In 2012–13, we published requirements for many licensees regarding proactive disclosure with local communities and the public. These requirements are contained in the document RD/GD-99.3, *Requirements and Guidance for Public Information and Disclosure*, which sets out CNSC requirements for licensees' public information programs and public disclosure (see spotlight story on page 25).

SAFE ENVIRONMENT

PROTECTING THE ENVIRONMENT TODAY AND FOR FUTURE GENERATIONS

The CNSC works hard to make sure that nuclear activities in Canada will not harm people or the environment.



Environmental monitoring and inspections are important work of the CNSC to ensure that Canada's nuclear sector is safe and that people and the environment are protected.

SAFETY SUMMED UP

- **Radiation doses to the public living around nuclear facilities remain far below regulatory dose limits.**

Every year, the CNSC leads a wide range of environmental protection assessment initiatives. These evaluate the potential environmental risk and significance of impacts of planned nuclear projects and propose solutions for mitigating those impacts. The CNSC also monitors and evaluates our licensees' environmental performance against strict criteria to ensure they comply with the legislative requirements set out in our regulatory framework.

In 2012–13, the CNSC completed the following environmental reviews under the former *Canadian Environmental Assessment Act*:

- An environmental assessment panel review by the independent Joint Review Panel for the Darlington New Nuclear Power Plant Project, OPG's proposal to construct and operate a new nuclear power plant at the Darlington Nuclear Generating Station in Clarington, Ontario
- Two comprehensive studies, including Cameco Corporation's Vision 2010, redevelopment of the Port Hope Conversion Facility in Port Hope, Ontario, and AREVA Resources Canada Inc.'s Midwest uranium mining and milling project at McClean Lake, Saskatchewan
- Two environmental screenings: OPG's project for the refurbishment and continued operation of the Darlington Nuclear Generating Station, and AREVA Resources Canada Inc.'s project to receive and process McArthur River uranium ore at the McClean Lake operation in Saskatchewan

NEW GUIDELINES FOR ENVIRONMENTAL ASSESSMENTS

In July 2012, the new CEAA 2012 came into effect and brought changes to the types of nuclear projects or undertakings that require an environmental assessment under the Act, focusing on very large and complex projects. In order to ensure that nuclear undertakings continue to be effectively assessed, the CNSC has formalized its practices under a new Environmental

Protection Assessment (EPA) process, which allows for increased opportunities for public participation and the continued stringent analysis of potential environmental impacts and implementation of appropriate mitigation measures under the NSCA. The CNSC's EPA process is efficiently integrated into the licence application review process for projects with a high level of interest from the public or Aboriginal groups, or a high possibility of adverse effects on the environment.

THE INDEPENDENT ENVIRONMENTAL MONITORING PROGRAM

In October 2012, the CNSC began implementing the Independent Environmental Monitoring Program. The first activities involved a pilot program collecting 30 environmental samples at Chalk River Laboratories and subjecting them to radiochemical analysis. The purpose of independent monitoring is to assure the public that effluent releases are tightly controlled by licensees and that the environment is protected. The full independent environmental monitoring program will be launched during 2013–14.

A CNSC inspector takes radiation readings from rock samples.

Spotlight Story

People – Essential in Ensuring Safe Nuclear Operations

Virtually all aspects of a nuclear facility – from its design and construction to its operation and overall performance – are affected by humans. In a perfect world, human performance would be flawless and error-free. In reality, mistakes can happen, so human performance must be given serious consideration.

The CNSC recognizes the critical importance of human actions on nuclear safety. That is why we oversee and verify human and organizational factors that may impact the planning, design, construction, management, maintenance and operation of a nuclear facility.

SUPPORTIVE MANAGEMENT SYSTEMS

Management systems help control how work is carried out at a nuclear facility and provide a framework for personnel to take appropriate actions in various situations. The CNSC requires and verifies that nuclear facility licensees implement a management system that supports all aspects of the NSCA and its pursuant regulations. More specifically, management systems must comply with the NSCA's requirements for health, safety, environmental issues, security, safeguards, and quality at a nuclear facility.

SUPPORTING HUMAN PERFORMANCE

Human performance considerations should be an integral part of the management system, in order to enable the people in the system to perform well. An effective human performance program integrates the full range of human factors considerations across all organizational functions and activities – not only the people, but also their tools, equipment, tasks and work environments – to ensure that people are fully supported in carrying out their work safely.

KEEPING ADEQUATE STAFF ONSITE

Regulations require licensees to have enough qualified workers onsite at their facilities, to be sure that work is carried out safely. The CNSC undertakes verification of these levels. For nuclear power plants, the minimum staff complement is the number of qualified workers who must be present at all times to ensure the safe operation of the nuclear facility and to respond adequately to emergencies. For each site, this is determined through analysis and demonstrated through validation exercises of the scenarios that would call for the most resources.

ENSURING WORKERS ARE WELL TRAINED

Effective training helps employees do their jobs well. Therefore, the CNSC expects all licensees to develop and implement training systems that are performance-oriented, systematically developed, and tailored to the needs and the learning characteristics of their workers. Licensees are also expected to use their training systems to define, design, develop, implement, evaluate, record and manage all training programs, including those for continued training, for all workers employed in safety-related positions.

CERTIFYING NUCLEAR WORKERS

In the same way that other laws require formal licensing for doctors, pilots and engineers, the NSCA empowers the CNSC to certify workers who perform certain types of nuclear-related activities. Certification adds a number of steps to worker qualifications, including independent exams.

SAFE URANIUM MINES AND MILLS

A NATURAL RESOURCE AS NUCLEAR FUEL

The CNSC ensures that the health of workers, local residents and the surrounding environment at uranium mine and mill sites are protected.

Uranium mines in Canada are regulated to ensure that all activities are safe.

SAFETY SUMMED UP

- **CNSC inspectors worked closely with provincial inspectors from the Saskatchewan ministries of labour and the environment to monitor licensees' occupational health and safety programs, including those for radiation protection. Personal dose records for operating mines and mills from 2006 to 2012 showed that radiation doses to workers were at safe levels and well below regulatory limits.**
- **The number of reportable events has remained stable at Canada's uranium mines and mills over the past several years (20 events in 2010, 21 in 2011 and 20 in 2012). Licensees are required to notify the CNSC of events or situations outside normal operations, and the CNSC follows up to ensure the licensee has a plan in place to prevent such events from recurring.**
- **In 2012–13, effluent discharges to the environment from uranium mining were within regulatory limits.**

Canada is the world's second-largest uranium producer, and 85 percent of Canada's uranium production is exported. Raw ore from uranium mines is processed at a milling facility to extract uranium, and the uranium concentrate is then further processed to create fuel for nuclear power reactors.

The CNSC conducts inspections every year at Canada's uranium mines and mills. These inspections ensure that radiation levels are kept well below regulatory limits, that workers and the public are protected from other potential hazards, and that all activities are environmentally safe. The handling and transport of uranium in Canada are also regulated by the CNSC.

In 2012–13, the CNSC continued its oversight of all operating Canadian uranium mines and mills (including Key Lake, Rabbit Lake and McArthur River), which are all in Northern Saskatchewan. In addition, the CNSC inspected the McClean Lake Operation (in maintenance and care mode) and Cigar Lake (under construction), also both in Saskatchewan.

The CNSC continued to review applications from companies that have expressed interest in establishing new uranium projects: Strateco Resources for the Matoush Underground Exploration project (Québec); AREVA Resources Canada for its Midwest (Saskatchewan) and Kiggavik (Nunavut) mining projects; and Cameco Corporation for the Millennium mine project (Saskatchewan).

CIGAR LAKE LICENSING FOR 2013

The Cigar Lake mine construction project is operated by Cameco Corporation in northern Saskatchewan. It is the world's second-largest known high-grade uranium deposit after Cameco's McArthur River operation.

Cameco Corporation is completing plans to become operational as authorized under its Uranium Mine Construction Licence, which expires in December 2013. Meanwhile, the Commission made plans to hold a licence hearing in April 2013. Mine production will require authorization by the Commission.

KIGGAVIK: TECHNICAL SUPPORT FOR NUNAVUT'S IMPACT REVIEW BOARD

The Kiggavik Project is a proposed uranium mining and milling operation by AREVA Resources Canada, located in the Kivalliq region of Nunavut, 80 km west of Baker Lake. AREVA is proposing to use open pit and underground mining to develop the ore at two main sites: Kiggavik and Sissons.

The Kiggavik project falls under the jurisdiction of the Nunavut Land Claims Agreement and is therefore subject to the Nunavut Impact Review Board's environmental assessment process rather than the *Canadian Environmental Assessment Act*. This is the first uranium mining project review by the Board. The CNSC has agreed to provide technical advice to the Board and participate in their process.

In May 2012, the Board initiated the public technical review period for the draft Environmental Impact Statement submitted by AREVA. In February 2013, it commenced a 60-day public comment period for the technical review.

MATOUSH UNDERGROUND EXPLORATION PROJECT: LICENCE TO EXCAVATE AN EXPLORATION RAMP

The Commission announced a decision on October 17, 2012 to issue a five-year licence to Strateco Resources Inc. to undertake underground uranium exploration following a public hearing held in the communities of Mistissini and Chibougamau, Québec on June 5 and June 7, 2012.

The scope of the licence is limited to advanced exploration activities, and not to mining or milling activities.

Since the Matoush project is the first advanced uranium exploration project in the Province of Québec, CNSC staff engaged in many outreach activities in 2009 and 2010 to assist Aboriginal peoples, the public, decision-makers and community representatives in understanding the regulation of the uranium mining industry. The government of Québec announced in March 2013 a temporary moratorium on uranium mining development pending public hearings by the provincial Bureau d'audiences publiques sur l'environnement on uranium mining in Québec. The project has been halted by the proponent as a result of this decision.

MCCLEAN LAKE: NEW LICENCE FORMAT AND CONDITIONS FOR URANIUM MINES

Following a public hearing in October 2012, the Commission announced in December its decision to amend the operating licence for AREVA's McClean Lake operation. The amended licence authorizes AREVA to receive and process ore slurry from the McArthur River Mine and increase annual production of uranium concentrate (yellowcake) from 3.6 million kg to 5.9 million kg per year.

In addition, the CNSC introduced a new licence format and conditions as part of AREVA's licence amendment request. This measure supports the CNSC's ongoing effort to streamline and modernize its regulatory framework while ensuring that there is a clear understanding for each requirement specified in a licence issued by the Commission.

CNSC staff prepared a Licence Conditions Handbook, which is a single document that consolidates the criteria that will be used to verify compliance with the licence, as well as interpretations and administrative control of licence conditions.

Cameco's McArthur River uranium mine in the Athabasca Basin, Saskatchewan.

Spotlight Story

Uranium Mines in Canada Demonstrate Strong Environmental Protection

Metal mines and mills in Canada are subject to the *Metal Mining Effluent Regulations* under Canada's *Fisheries Act*. In 2012, a CNSC study of data reported to Environment Canada between 2007 and 2010 found that of all types of metal mines and mills in Canada, uranium mines complied best with the regulations' limits. Their environmental performance was stronger than the other metal mining sectors.

The study looked at five uranium mines, 43 base metal mines (such as copper, nickel, and zinc), 50 precious metals mines and 7 iron mines. It studied the performance of mines under the following three categories.

1. EFFLUENT CONCENTRATION LIMITS AND PH

To be "in compliance" under this category, a mine's effluent (or waste) must adhere at all times to specific parameters for the various substances and pH limits that are tested. Uranium mines were 100 percent compliant over four years, while other types of mines varied from 43 percent compliant to 88 percent compliant.

2. CONTAMINANTS IN EFFLUENT

In this category, the effluent quality from the uranium sector was as good as or better than that of the effluent from the other mining sectors. Interestingly, uranium mines and mills had a lower concentration for radium-226 than the base-metal sector. They also had significantly lower concentrations of total suspended solids in 2010 than the other metal-mining sectors.

3. TOXICITY

Regulators use rainbow trout to test the cleanliness of effluent in a process called the acute-lethality test (where a "pass" requires more than half the trout placed in undiluted effluent to survive for four days). In this category, a mine is considered compliant if its effluent passes all such tests throughout the year. All uranium mine and mill facilities had full compliance, with levels below the authorized effluent discharge limits, and nearly all met acute-lethality requirements from 2007 to 2010.

There was one exception: In 2008, the Key Lake Operation had 2 out of 14 tests fail. Follow-up tests and an investigation were extensive, and the CNSC was satisfied with the follow-up actions taken by Cameco Corporation, the operator of Key Lake.

SAFE NUCLEAR PROCESSING AND RESEARCH

AN IMPORTANT PART OF CANADA'S NUCLEAR SECTOR

Uranium processing plants and research facilities that use nuclear energy are carefully regulated and licensed by the CNSC to protect Canadians and the environment.

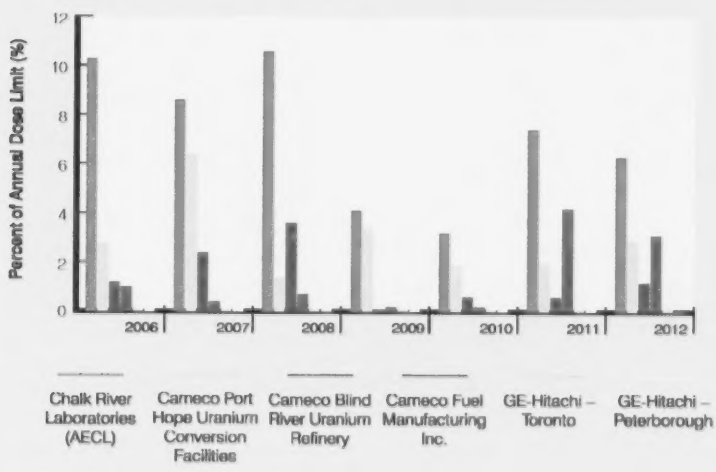
TRIUMF and Advanced Cyclotron Systems, Inc's Cyclotron in Vancouver, British Columbia.

SAFETY SUMMED UP

- In 2012–13, there were no events with consequences to public health or the environment.
- The annual radiation dose limit for members of the public is 1 mSv. Radiation doses to the public continued to be well below regulatory limits (see figure 1).

FIGURE 1

Public radiation doses as a percentage of regulatory limits for six major Canadian nuclear processing and research facilities



Radiation doses to members of the public, from Canadian nuclear processing and research facilities, were well below the regulatory limit of 1 mSv per year between 2006 and 2012.

Note: The scale in the above figure represents the percentage of the 1 mSv annual public dose limit.

Note: Public doses originating from both GE-Hitachi facilities historically have been negligible (<0.001 mSv/yr); however, GE has started using enhanced measuring techniques and can now report with greater accuracy.

The CNSC oversees nuclear processing and research facilities to protect people who live and work nearby, and to protect the surrounding environment. From uranium processing facilities to research reactors and accelerators, nuclear-related processing and research plays an important role in Canadians' lives. For example, research reactors and accelerators are used in scientific research and training, for testing materials and to produce radioisotopes for medical procedures.

The following highlights provide further information on the figure on the previous page.

BLIND RIVER REFINERY

In June 2012, CNSC staff received written notification from Cameco about an incident where three workers were exposed to uranium concentrate powder (yellowcake). The CNSC requested Cameco to submit an analysis of its practices to protect workers from airborne uranium, and an analysis of lessons learned from the medical and emergency response that followed the incident. The CNSC also requested all Canadian uranium mills to review their operations and take action to help prevent such incidents. Cameco is reviewing its practices and will make the necessary changes to prevent similar occurrences.

SHIELD SOURCE INC.

In March 2013, Shield Source Incorporated (SSI) of Peterborough, Ontario announced it would not apply to renew its nuclear processing licence, but instead apply for a licence to decommission the facility. The CNSC will provide regulatory guidance throughout this process and continue its increased oversight at SSI to ensure the public and environment are protected.

GE-HITACHI

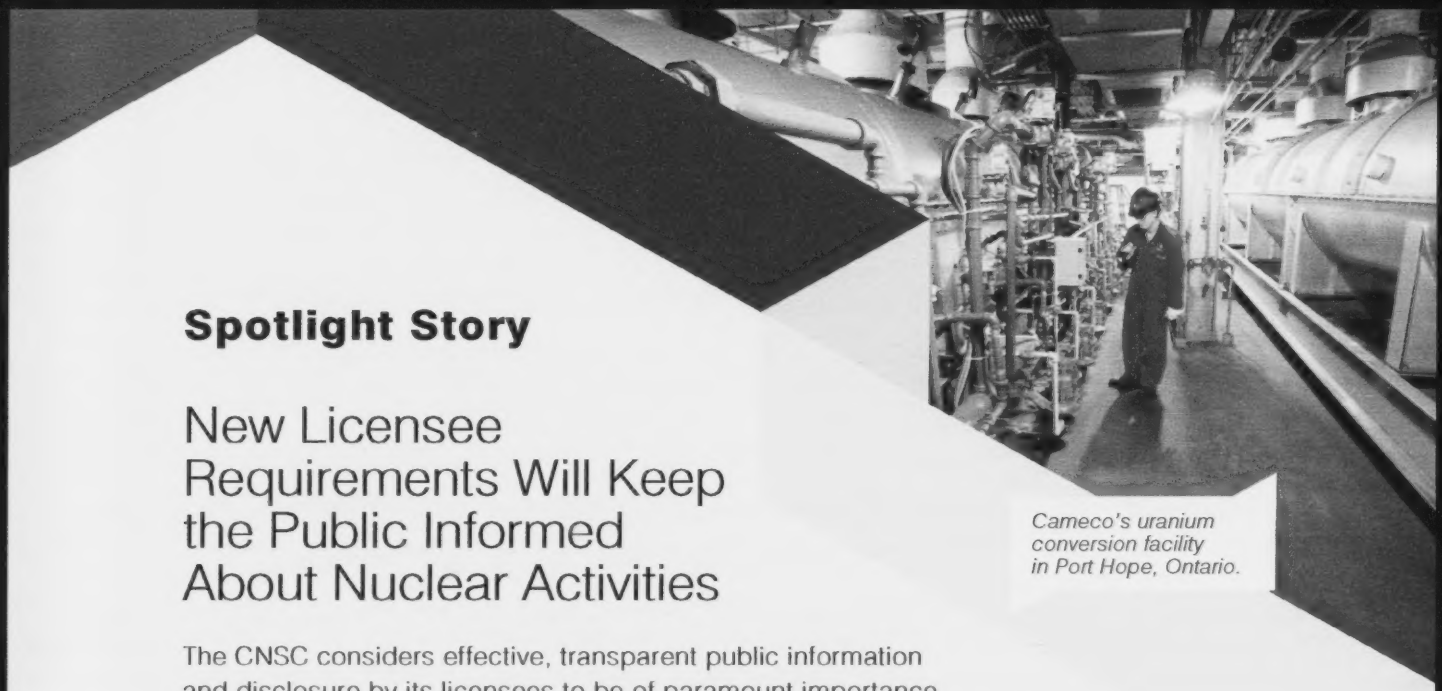
In fall 2012, public interest increased in the Toronto facility operated by GE Hitachi Nuclear Energy Canada Inc. As a result, CNSC staff directed the licensee to significantly strengthen its public information and disclosure program to address community concerns about safety and transparency, in accordance with the regulatory document RD/GD-99.3, *Public Information and Disclosure*. Consequently, GEH-C is undertaking several new initiatives to inform residents about its nuclear activities.

In December 2012, CNSC staff participated in a public information session organized by the Member of Parliament for Davenport, to discuss the operations of GEH-C's Toronto facility and address local residents' concerns.

CHALK RIVER LABORATORIES – ATOMIC ENERGY OF CANADA LIMITED

The Government of Canada announced in February 2013 that management at AECL's nuclear laboratories would be restructured as the Government seeks to implement a Government-owned, Contractor-operated operation. The government will focus the laboratories on three key objectives: manage its radioactive waste and decommissioning responsibilities; perform science and technology activities to meet core federal responsibilities; and support Canada's nuclear industry through access to science and technology facilities and expertise on a commercial basis.

The CNSC will continue to regulate AECL's nuclear laboratories during and after the restructuring.



Cameco's uranium conversion facility in Port Hope, Ontario.

Spotlight Story

New Licensee Requirements Will Keep the Public Informed About Nuclear Activities

The CNSC considers effective, transparent public information and disclosure by its licensees to be of paramount importance. This is especially important for licensees operating near host communities. These communities have a right to know how their health and environment are being protected.

In 2012, the CNSC published a new regulatory document called RD/GD-99.3, *Public Information and Disclosure*. The document sets out for licensees what the CNSC requires with respect to public information programs and public disclosure. It covers all Class I nuclear facilities, certain Class II facilities and all uranium mines and mills in Canada.

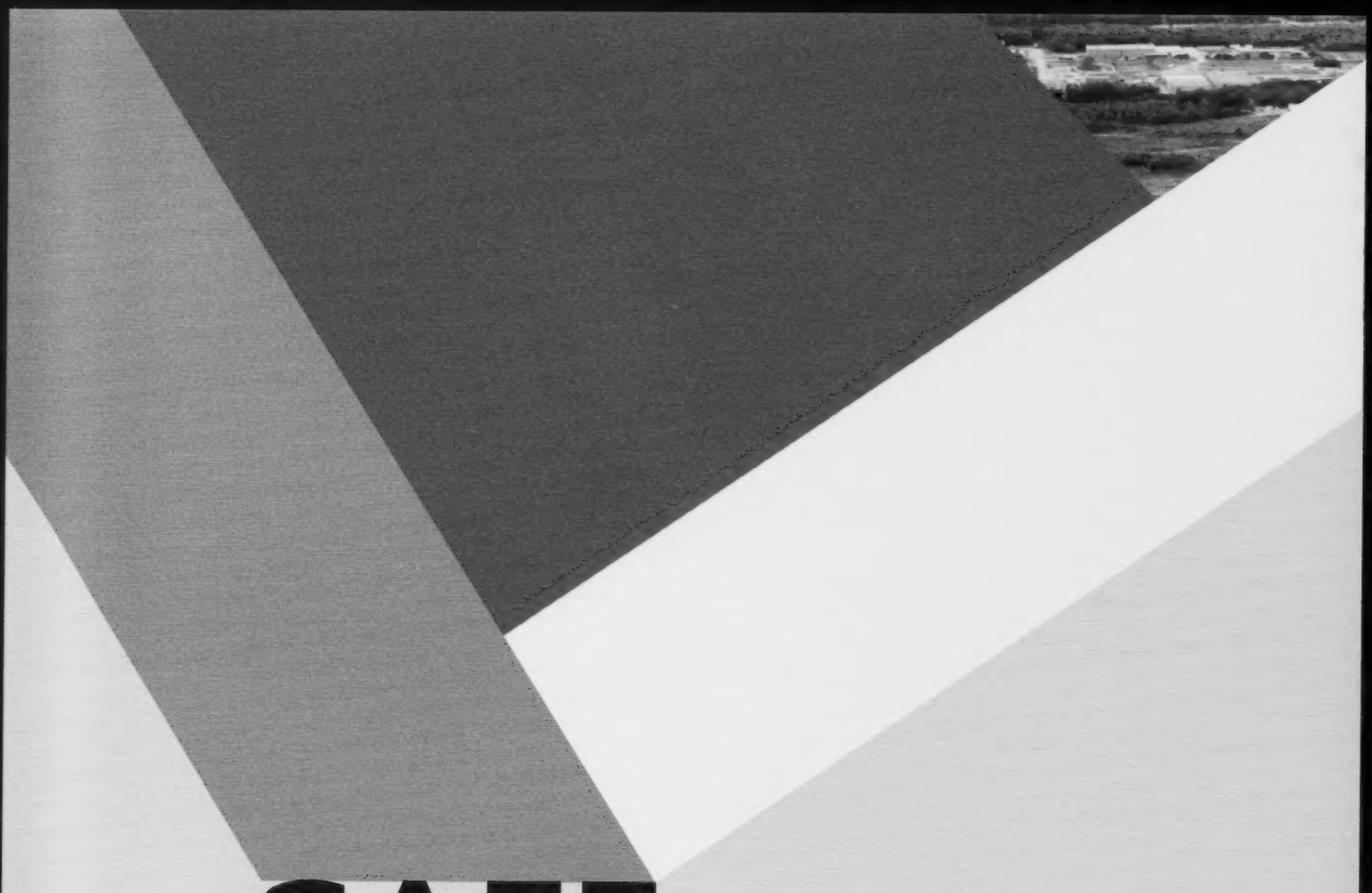
CLASS I AND CLASS II FACILITIES

Class I nuclear facilities are nuclear power plants, nuclear fuel processing and fabrication facilities, research reactors and waste facilities. Class II nuclear facilities include those that house irradiators, particle accelerators, and other equipment such as cancer treatment machines.

PROTOCOLS REFLECT PUBLIC EXPECTATIONS

RD/GD-99.3 calls for licensees of nuclear facilities to develop public information programs with an eye to informing communities about the type of nuclear facility in question and about the regulated activities taking place there. Facilities must also communicate any potential risks to public health, safety and security, and the environment that the facility poses.

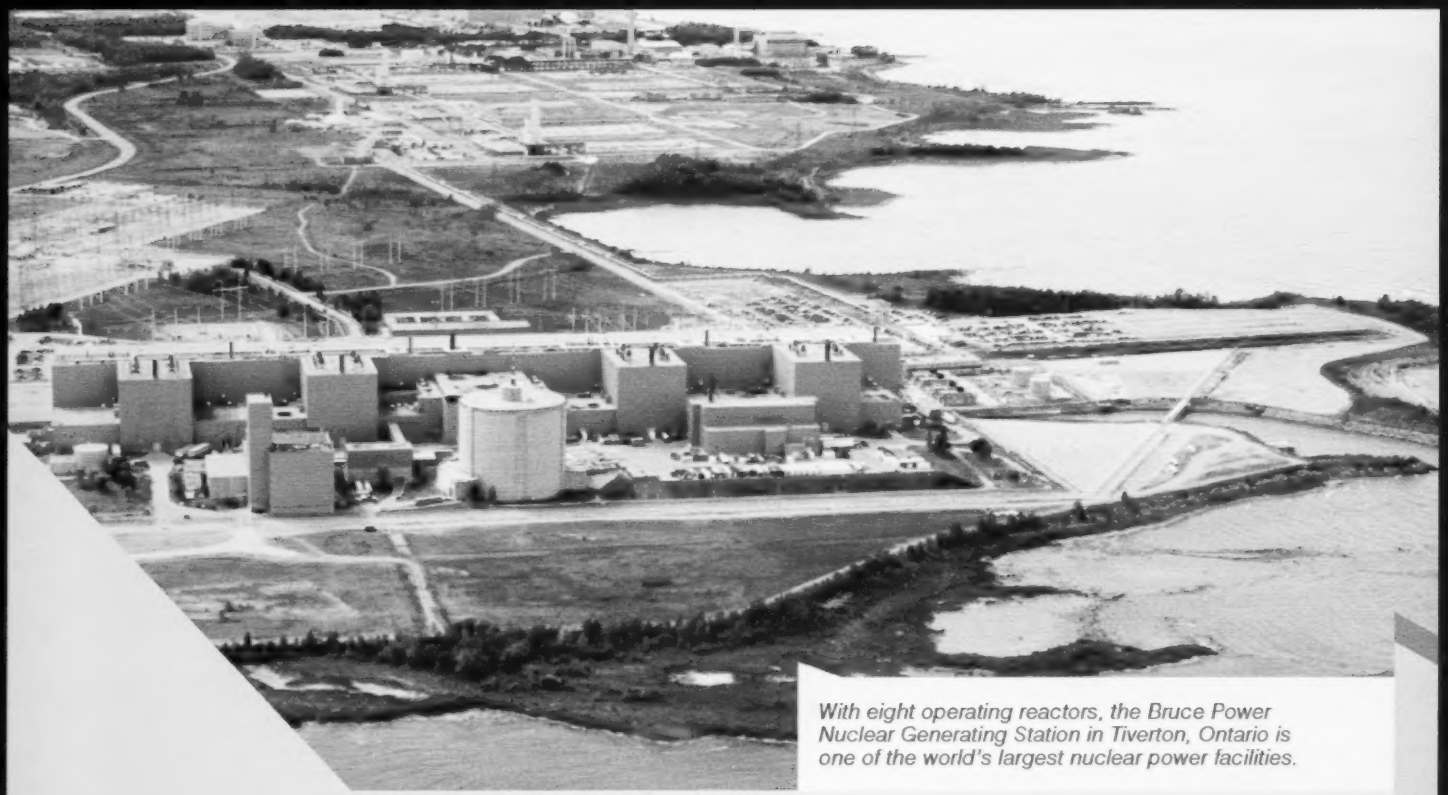
Licensees are required to consider the level of public interest or concern in their host communities as they develop their information programs. In addition, each facility licensee must consult with their stakeholders and develop a public disclosure protocol that is detailed enough to ensure that communities and any other interested parties are informed on a timely basis about the facility's operations, activities and events. This material should include any potential effects of those activities on the environment or the health and safety of people.



SAFE NUCLEAR POWER

SAFE OPERATION OF NUCLEAR REACTORS IN CANADA

The CNSC regulates all nuclear power plants in Canada. It carefully evaluates licence applications against strict criteria. The CNSC also uses verification, enforcement and mandatory reporting measures to ensure licensees comply with all requirements.



With eight operating reactors, the Bruce Power Nuclear Generating Station in Tiverton, Ontario is one of the world's largest nuclear power facilities.

SAFETY SUMMED UP

In 2012, all NPPs operated safely, making adequate provisions to protect the health, safety and security of Canadians and the environment. Highlights for the year include:

- **There were no serious process failures at any NPP.**
- **No worker or member of the public received a radiation dose above regulatory limits.**
- **The frequency and severity of non-radiological injuries to workers was minimal.**
- **No radiological releases from the stations exceeded the regulatory limits.**
- **Licensees complied with their licence conditions regarding Canada's international obligations.**

SAFETY PERFORMANCE ASSESSMENT

Each year, the CNSC publishes a report on the safety performance of the Canadian nuclear power industry. Table 1 summarizes the 2012 ratings for each facility in 14 different safety and control areas (SCAs) and provides industry averages. A total of 9 "fully satisfactory" ratings were obtained, the highest number since 2010. The Canadian nuclear power industry achieved an average rating of "fully satisfactory" in the conventional health and safety SCA.

Table 1 also summarizes integrated ratings for each facility. The integrated plant ratings for the period were either "fully satisfactory" or "satisfactory" for all stations. This is the fifth consecutive year that these overall results have been achieved.

From 2006 to 2012, radiation doses to members of the public living near Canadian nuclear power plants were under one percent of the regulatory dose limit.

Table 1

Canadian nuclear power plant safety performance ratings for 2012

Safety and control area	Bruce		Darlington	Pickering		Gentilly-2	Point Lepreau	Industry average
	A	B		A	B			
Management system	SA	SA	SA	SA	SA	SA	SA	SA
Human performance management	SA	SA	SA	SA	SA	SA	SA	SA
Operating performance	SA	SA	FS	SA	SA	SA	SA	SA
Safety analysis	SA	SA	SA	SA	SA	SA	SA	SA
Physical design	SA	SA	SA	SA	SA	SA	SA	SA
Fitness for service	SA	SA	FS	SA	SA	SA	SA	SA
Radiation protection	SA	SA	FS	SA	SA	SA	SA	SA
Conventional health and safety	FS	FS	FS	SA	SA	SA	FS	FS
Environmental protection	SA	SA	SA	SA	SA	SA	SA	SA
Emergency management and fire protection	SA	SA	SA	SA	SA	SA	SA	SA
Waste management	SA	SA	SA	SA	SA	SA	SA	SA
Security	FS	FS	SA	SA	SA	SA	SA	SA
Safeguards and non proliferation	SA	SA	SA	SA	SA	SA	SA	SA
Packaging and transport	SA	SA	SA	SA	SA	SA	SA	SA
Integrated plant rating	SA	SA	FS	SA	SA	SA	SA	SA

The rating categories are as follows: fully satisfactory (FS), satisfactory (SA), below expectations (BE) and unacceptable (UA).

REGULATORY MILESTONES AND HIGHLIGHTS

Darlington refurbishment

In December 2012, the Commission held public hearings to examine the environmental assessment for the refurbishment of the Darlington Nuclear Generating Station and its continued operation until 2055. The Commission issued its decision in March 2013, concluding that the proposed project was not likely to lead to significant adverse environmental impacts.

The Commission also renewed Darlington's power reactor operating licence for 22 months. The next licence renewal, planned for 2014, will closely examine all proposed refurbishment activities for the facility's four operating units (see spotlight story on page 30).

Pickering licence renewal

The Commission held public hearings in February with plans for Day-2 hearings in May 2013 to consolidate and renew the power reactor operating licences for the Pickering Nuclear Generating Station. The proposed licence establishes clear requirements for continued operation of the plant.

OPG intends to end commercial operation of its six operating units in 2020 (the other two units onsite were put in safe storage in 2010).

Gentilly-2 ended commercial operation

Hydro-Québec ended commercial operation of Gentilly-2 in December, 2012. Defueling of the reactor core started early in 2013 and should be completed by the fall. The reactor will then be placed in safe storage for an extended period of time in preparation for decommissioning.

Point Lepreau returned to service

In 2012, NB Power returned its Point Lepreau single-unit station to service after an extensive refurbishment. Several safety enhancements were made to the plant, including the installation of emergency make-up water and emergency containment filtered ventilation systems.

Bruce: Two units returned to service

Bruce Power completed the refurbishment of units 1 and 2 at Bruce A in 2012. Both units were then returned to service, making this station one of the largest nuclear power facilities in the world.

The "Huron Challenge – Trillium Resolve" emergency management exercise took place in October 2012, demonstrating that the facility has an effective emergency management program and can respond to severe weather threats.

IMPLEMENTATION OF CNSC ACTION PLAN IN RESPONSE TO FUKUSHIMA

The CNSC Action Plan, implemented in response to the events at Fukushima, identifies measures to strengthen defence in depth at NPPs and other major nuclear facilities. The Action Plan also identifies specific measures to enhance emergency preparedness, regulatory oversight and the CNSC's crisis communication capabilities. In total, the Action Plan lists 36 distinct actions for NPPs and staff, 14 for other major nuclear facilities and 14 to enhance crisis communications. These actions are being implemented in three phases: short term (12 months); medium term (24 months); and long term (36–48 months). In 2012–13, all short-term actions were completed.

Before being presented to the Commission for its endorsement, the Action Plan was subject to three rounds of public consultations and the scrutiny of two independent review panels (IAEA mission and External Advisory Committee established by the Commission's President).

Second Extraordinary Meeting of the *Convention on Nuclear Safety*

The Second Extraordinary Meeting of the *Convention on Nuclear Safety* (CNS) was held in August 2012 at the IAEA headquarters. This special meeting was established to:

- enhance nuclear safety through the review and sharing of lessons learned and actions taken by Contracting Parties in response to events at Fukushima
- review the effectiveness and consider the suitability of CNS provisions

A report on proposals by Contracting Parties to improve the effectiveness of the CNS triennial review process through enhanced openness and transparency will be presented at the Sixth Review Meeting in March 2014.

ENHANCED PUBLIC DISCLOSURE

In 2012–13, licensees completed the transition to comply with new regulatory requirements for public information and disclosure programs, developing protocols with local stakeholders in order to make their operations more transparent to community members (see spotlight story on page 25).

The Darlington Nuclear Generating Station in Clarington, Ontario.

Spotlight Story

The Darlington Refurbishment Project

Among the largest and most complex infrastructure projects in the country, refurbishments of Canada's nuclear power plants (NPPs) are also some of the projects most closely scrutinized by regulators, the public and technical experts. The refurbishment of the Darlington Nuclear Generating Station is no exception.

HOLDING A DEDICATED PUBLIC PROCESS

In late 2012, the Commission held public hearings to examine the environmental assessment completed for the refurbishment of the Darlington Nuclear Generating Station and its continued operation. In March 2013, the Commission concluded in its decision that the project was not likely to lead to significant adverse environmental impacts. The Commission, which renewed the facility's operating licence for 22 months did not authorize refurbishment activites. The commission will examine specific refurbishment activities in 2014 as part of the public proceedings for licence renewal.

Along with the opportunity to repair and replace components, refurbishing a facility also provides opportunities for safety enhancement. For Canadian NPPs, such improvements include the installation of emergency systems and equipment to further strengthen the plants' ability to prevent severe accidents or mitigate their consequences. Before its licence renewal in 2014, OPG must complete a thorough review to identify all possible safety improvements that can be implemented at its Darlington facility as part of refurbishment.

DARLINGTON PUBLIC HEARING BY THE NUMBERS

4 days of public proceedings webcast live

690 intervenors

90 oral presentations

212 written submissions

5,360 pages in environmental assessment documentation

$92,000 awarded for participant funding

APPLYING THE MANY LESSONS LEARNED FROM OTHER REFURBISHMENTS

In its oversight of the proposed Darlington refurbishment project, the CNSC is benefiting from the extensive experience it gained when the Bruce and Point Lepreau nuclear facilities were refurbished. In April 2013, environmental groups filed a legal challenge alleging that the CNSC failed to comply with the *Canadian Environmental Assessment Act* in its decision to approve the environmental assessment for the refurbishment of the Darlington nuclear generating station.

SAFE NUCLEAR MEDICINE

DIAGNOSING AND TREATING DISEASES

The CNSC regulates medical uses of nuclear substances and radiation devices, ensuring that equipment and licensed activities are safe for Canadians.

Health care workers in nuclear medicine departments at hospitals and clinics throughout Canada handle radioactive substances safely every day.

SAFETY SUMMED UP

- **The CNSC performed 295 inspections in the medical sector during 2012–13.**
- **There were 39 events reported in 2012 compared to 6 in 2009, 18 in 2010 and 24 in 2011. Most events in the medical sector relate to spills of unsealed sources in the laboratories where they are processed. CNSC staff initiated an event reporting outreach campaign in 2009 for licensees handling unsealed sources. The number of reported spills and subsequently the number of reported events increased in the following two years. None of the events reported in the medical sector resulted in a radiation dose to the public in excess of regulatory limits.**
- **Data from sampled annual compliance reports in the medical sector demonstrate that occupational doses for nearly 90 percent of all medical sector employees has remained below 0.5 mSv per year. This is well below the regulatory limit of 50 mSv for nuclear energy workers and also lower than the regulatory dose limit of 1 mSv per year for members of the public. No employee in this sector received a dose in excess of the regulatory dose limits. The average dose from natural background radiation received by persons residing in Canada is 2 mSv/year.**

Nuclear medicine diagnoses diseases such as cancer and heart disease by combining radioactive isotopes with other chemical compounds to form radiopharmaceuticals. Radiopharmaceuticals are given to patients by injection, in a pill, ingestion or inhalation. Once inside, the radiopharmaceuticals emit radiation that is detected by equipment such as gamma cameras or positron emission tomography (PET) scanners. These create pictures of organs, tissues and other internal structures that a doctor could not otherwise see. In some cases, radioactive isotopes are used to treat illnesses such as thyroid cancer. This option is less invasive than alternatives like surgery.

Medical equipment used for such procedures is licensed as Class II prescribed equipment. Medical licensees also use radiation devices, which must be certified. The CNSC conducts onsite inspections and desktop evaluations to ensure that medical licensees conform to the NSCA as well as regulations and licence conditions.

The CNSC is also responsible for regulating medical accelerators and Class II nuclear facilities found in hospitals, and prescribed equipment in Canada. Historically, the Canadian medical sector represents around 20 percent of all CNSC licences.

INTRODUCTION OF LICENCES FOR LOW-ENERGY ACCELERATORS

The CNSC recently began licensing all particle accelerators operating at a beam energy level of 1 megaelectron-volt (MeV) or more. The decision to include low-energy accelerators reflected recent developments in accelerator technology, and will ensure adequate and consistent oversight over this class of equipment (see spotlight story on page 35).

LICENCE RENEWALS FOR TRIUMF AND CANADIAN LIGHT SOURCE

Following public hearings in May 2012, the Commission renewed the particle accelerator Class IB operating licences for both TRIUMF Accelerators Inc. and Canadian Light Source Inc., for 10 year periods. As part of its decision, the Commission directed CNSC staff to provide annual reports on the performance of TRIUMF and Canadian Light Source. CNSC staff will present these reports at public proceedings of the Commission.

GROWTH IN USE OF MEDICAL ISOTOPES

The CNSC has noted a shift in the use of isotopes in nuclear medicine. The decreased use of technetium 99m in favour of thalium 201, in response to isotope shortages in 2008, has been reversing as the medical community returns to technetium 99m for cardiac imaging.

Licensing of indium-111 has also increased due to an interest in using it for imaging white blood cell concentrations, which can indicate the possibility of an infection. The use of cyclotrons and other accelerator technology continues to grow for the production of medical isotopes (see spotlight story on page 35).

Spotlight Story

Licensing of New Medical Technology

New innovative medical technology, such as low-energy accelerators, enable doctors to image and treat patients with a single device.

The CNSC is now licensing novel, low-energy accelerator technologies in the medical sector. Some of this technology, such as robotic-arm radiotherapy accelerator, enables physicians to more accurately target small tumours in the body. Other prescribed equipment includes hybrid devices that combine the imaging capability of computed tomography (CT) scanners with a medical accelerator, enabling doctors to image and treat patients with a single device.

Historically, the CNSC has licensed medical devices that use high-energy electrons or photon beams, which are widely used in radiation therapy to treat various types of cancer. However, in 2011, the CNSC broadened its oversight, announcing that it would require licensing for all devices with a beam energy level of 1 mega-electron-volt – including low-energy accelerator technology.

The CNSC is also looking into the regulatory and licensing implications of these machines when they are put to other uses – for example, as mobile cargo screening accelerators used at several ports in Canada.

Phase I of the licensing of low-energy linear accelerators involved licensing models that were certified to operate at higher energy but that had been configured to operate at low energy only – and therefore had not been previously licensed. The CNSC licensed nine of these accelerators in 2012.

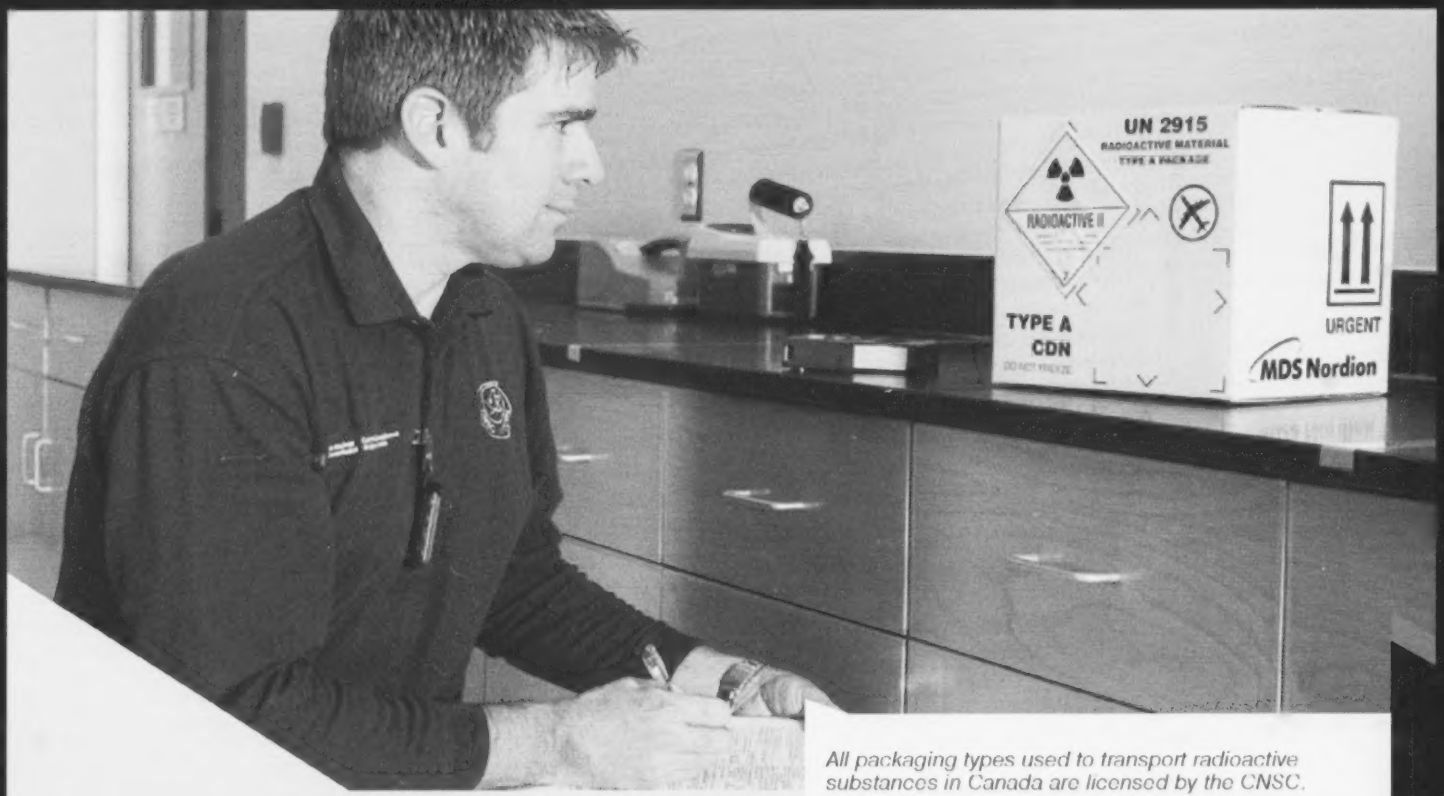
Phase II involves certifying and licensing low energy accelerators that have never been certified or licensed previously by the CNSC. In 2012–13, the CNSC received six applications for certification, and additional applications are expected for 2013–14. Other accelerators were also identified, but considered exempt as they were single-installation devices used for research and development activities not conducted on humans.

The target date for certification and licensing of all such technology is the end of 2013.

SAFE NUCLEAR SUBSTANCES AND TRANSPORT

NUCLEAR TECHNOLOGY CONTRIBUTES TO CANADIANS' EVERYDAY LIFE AND WELL-BEING

From licensing the possession of nuclear substances to overseeing the safe transport of nuclear material, the CNSC strictly oversees all uses of nuclear-related substances in industry, academia and the commercial sectors.



All packaging types used to transport radioactive substances in Canada are licensed by the CNSC.

SAFETY SUMMED UP

- The CNSC performed 1,415 inspections in the academic, commercial and industrial sectors.
- During 2012–13, the CNSC issued 193 new transport licences, revised 32 transport licences and issued 29 transport certificates for package design and for special form radioactive material.
- During 2012–13, for radiation devices and Class II prescribed equipment, the CNSC issued 44 new licences, revised 18 licences and renewed one licence.
- As of March 2013, the CNSC provided at regulatory oversight of 115 industrial radiography licences.
- Data from sampled annual compliance reports in the industrial, academic, and commercial sectors demonstrate that, from 2008 to 2011, the vast majority of nuclear energy workers received less than the public dose limit of 1 mSv per year. This is significantly less than the regulatory limit of 50 mSv per year for nuclear energy workers.
- Industrial radiography doses to certified exposure device operators remained under 2 mSv per year. 2012–13 saw a 20% improvement over last year, with over half of the workers sampled receiving less than the public dose limit of 1 mSv per year.
- The CNSC issued 21 orders to licensees across the industrial/academic sector during the reporting period and 1 formal regulatory request as a result of non-compliance.

Nuclear technology touches many aspects of life. It is used in medicine, industrial applications, academic and research projects and commercial ventures. The CNSC carries out licensing, certification and compliance verification for more than 2,500 licensees of nuclear substances, prescribed equipment and Class II nuclear facilities involved in medical, industrial, commercial and academic settings.

INDUSTRY

Portable gauges are most often used to measure moisture content and verify the density of pavement. The CNSC's focus for inspecting portable gauges has shifted away from reviewing records toward a performance-based method that involves direct observation of the operator's behaviour. The CNSC is therefore now issuing more orders for corrective action and conducted more frequent inspections over the past year, to verify that licensees are complying with all regulations and to ensure the safe use of nuclear substances across industry.

ACADEMIA

Universities are using accelerators for varied research purposes. These include investigating the effects of aging on materials used in the construction of power reactors, and using a spectrometer with accelerator technology to determine isotope ratios in test samples.

COMMERCIAL SECTOR

One commercial venture involves a company that is attempting to develop a fusion reactor to generate electrical power. The CNSC is ensuring the licensee has taken adequate measures to protect workers, the public and the environment from radiation that may be produced as a consequence of a successful fusion reaction in its prototype device.

As of March 2013, the industrial sector accounted for more than 1,455 licences, the academic and research sector for 270 and the commercial sector for 583. The CNSC focuses its inspections where risk is highest and where it has concerns about the licensee's performance.

The CNSC has a program in place to ensure that lost or stolen nuclear substances and radiation devices are tracked and recovered as soon as possible.

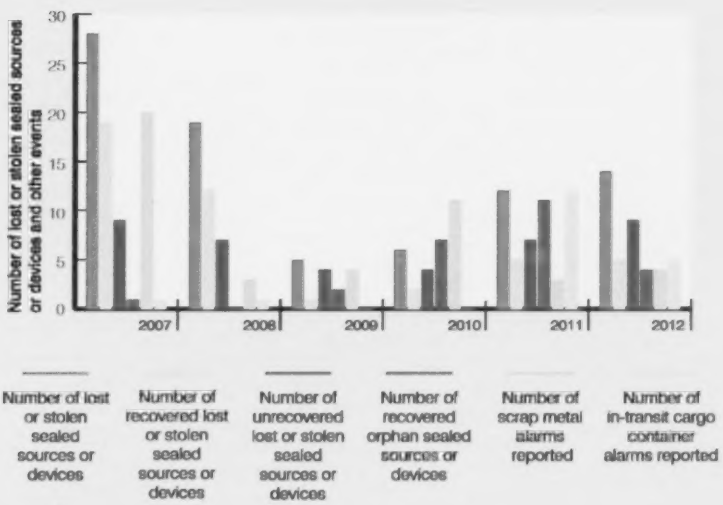
TRANSPORTATION OF NUCLEAR SUBSTANCES

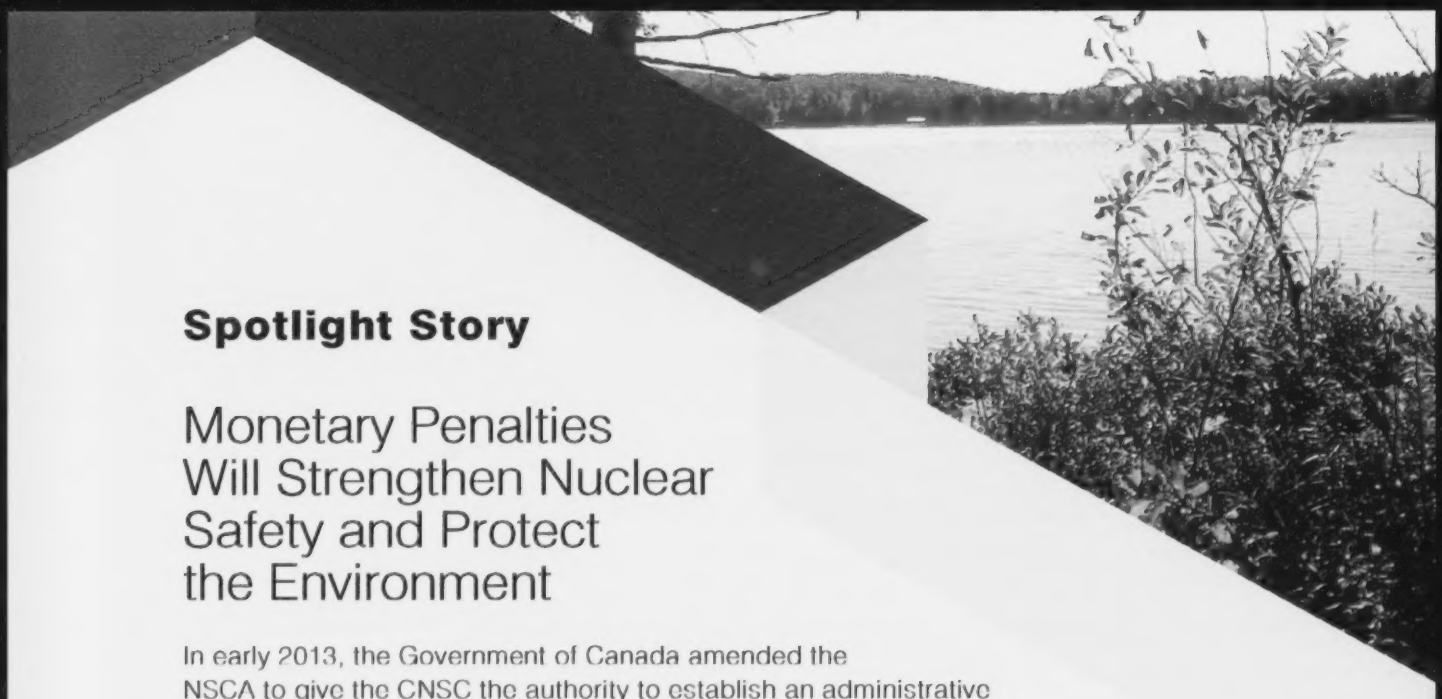
Canada is both a significant producer and major exporter of nuclear substances. The CNSC shares responsibility with Transport Canada for overseeing the safe transport of more than a million packages containing nuclear substances in Canada per year.

The CNSC is updating its *Packaging and Transport of Nuclear Substances Regulations* to reflect changes to international regulations issued by the IAEA. In 2012, a discussion paper was published by the CNSC in an effort to communicate publicly before formal consultations took place. The new regulations are expected to come into force in 2014, following a formal regulatory consultation process in 2013.

FIGURE 2

Lost or stolen sealed sources or devices and other events





Spotlight Story

Monetary Penalties Will Strengthen Nuclear Safety and Protect the Environment

In early 2013, the Government of Canada amended the NSCA to give the CNSC the authority to establish an administrative monetary penalty (AMP) system for violations of the NSCA, its regulations or licences.

In simple terms, the new AMP system means that any regulated individual or corporation that violates a regulatory requirement may have to pay a monetary penalty. The amount of the penalty will depend on the nature and severity of the violation.

LARGE PENALTIES FOR LARGE VIOLATIONS

This is the first time in Canadian history that the CNSC has introduced monetary penalties. First, regulations that define violations and set the level of penalties under the AMP system will be drafted. Once these are finalized and approved by the Government, the CNSC will have the authority to level penalties of up to $25,000 for individuals and up to $100,000 for corporations for each day they are not complying with requirements. The CNSC will set penalties based on factors such as the degree of negligence, the compliance history of the violator, and whether the violator has been cooperative.

The CNSC pre-published draft regulations in the *Canada Gazette, Part I* in February 2013. The draft regulations set out a detailed list of violations, as well as the proposed method and criteria for determining the amounts of penalties and how persons who have committed a violation will be notified of violations and respective monetary penalties. Final regulations, approved by the Government are expected to come into force in July 2013.

PENALTIES ARE NOT ALWAYS THE ANSWER

The CNSC will continue to use all means of enforcement, such as regularly discussing how to correct incidents of non-compliance with licensees, giving written notices to violators, and even revoking licences when necessary. CNSC inspectors will continue to assess the significance of each non-compliance that they may discover. Based on the regulatory significance of the non compliance, the urgency of corrective action required and the compliance history of the individual or corporation – among other factors – the inspectors will determine the necessary course of enforcement action.

SAFE WASTE MANAGEMENT

SECURE STORAGE FOR FUTURE GENERATIONS

Radioactive waste in Canada is strictly regulated by the CNSC to ensure it poses no undue risks to people or the environment.

Dry storage containers which hold spent nuclear fuel are transferred at the Pickering Nuclear Generating Station in Pickering, Ontario.

SAFETY SUMMED UP

- **Doses to the public did not exceed regulatory limits.**
- **Doses to workers at waste facilities did not exceed regulatory limits.**
- **No regulatory releases from nuclear waste facilities exceeded regulatory limits.**

In 2012–13, the CNSC oversaw relicensing for the waste management facilities at OPG's Darlington nuclear power plant. It also focused on other major waste-related projects, including AECL's Port Hope Area Initiative for Long-Term Low-level Radioactive Waste Management, OPG's Deep Geologic Repository for storing low- and intermediate-level waste, and the Nuclear Waste Management Office's plan for managing used nuclear fuel.

PORT HOPE AREA INITIATIVE

In October 2012, the Commission authorized AECL to begin Phase II of the Port Hope Long-term Low-level Radioactive Waste Management Project and extend the licence to December 31, 2022. The project is a component of the Port Hope Area Initiative, a community-based endeavour established by the Government of Canada and the Municipalities of Port Hope and Clarington to implement a safe, long-term management solution for low-level radioactive waste in the area.

TWO GEOLOGIC REPOSITORY PROJECTS

Two long-term radioactive waste management initiatives are underway in Canada that may result in geologic repositories. A geologic repository is constructed underground, usually at a depth of several hundred metres or more below the surface in a stable rock formation.

1. Ontario Power Generation's proposed Deep Geologic Repository for low- and intermediate-level radioactive wastes

OPG is proposing a deep rock vault in clay rich limestone, hundreds of meters below ground. The DGR is designed to be a long-term management facility for OPG's low- and intermediate-level

radioactive wastes. The proposed location for the repository is the Bruce nuclear site in Tiverton, Ontario. In June 2007, the Minister of the Environment referred the repository project's environmental assessment to an independent Joint Review Panel, which was officially announced in early 2012. The review panel will examine the environmental assessment and the first stages of licensing.

CNSC staff and research experts supported the work of the review panel in 2012–13 as it evaluated OPG's environmental impact statement and licence application. Once the review is complete, the review panel will hold public hearings on the environmental assessment and the licence application for site preparation and construction in September and October 2013.

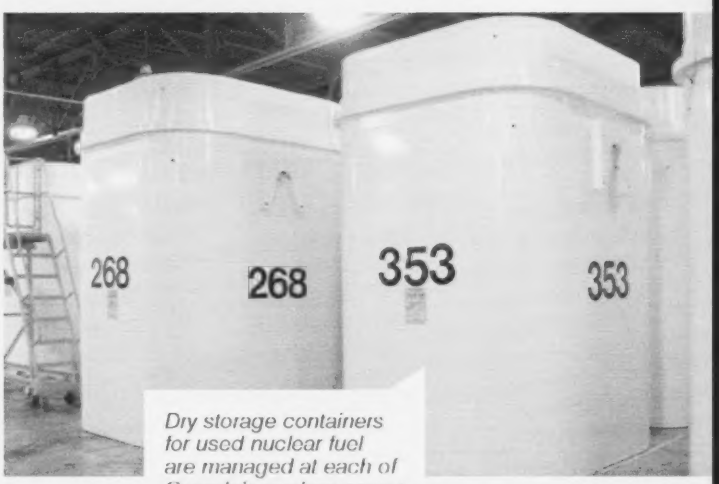
2. The Nuclear Waste Management Organization's plan for a geologic repository for used nuclear fuel

The Nuclear Waste Management Organization (NWMO) consulted with Canadians since 2009 to identify an informed community willing to host a geological repository for used nuclear fuel in Canada.

CNSC staff and research contractors supported the process by undertaking extensive technical assessments and evaluations of several case studies submitted by the NWMO. This work determined whether the proposed designs, safety analyses and other required information comply with all regulations. The CNSC brings to the work its extensive experience and knowledge of best practices in radioactive waste management from existing facilities in Canada and around the world.

STORAGE FOR A MILLION YEARS

The CNSC is conducting a research program to evaluate long-term (up to a million years) safety issues related to the disposal of radioactive waste and used nuclear fuel in sedimentary rock. This program consists of independent scientific research conducted by CNSC staff in collaboration with national and international institutions. It also includes the monitoring and review of state-of-the-art scientific advancements, and participation in international forums to exchange information and knowledge on geological repositories.



Dry storage containers for used nuclear fuel are managed at each of Canada's nuclear power generation sites.

TABLE 2

Radioactive waste inventories for used nuclear fuel and low- and intermediate-level radioactive waste in Canada, as reported in 2010

Waste category	Waste produced in 2010	Waste inventory to the end of 2010
Nuclear fuel waste	298 m^3	9,075 m^3
Intermediate-level radioactive waste	208 m^3	32,906 m^3
Low-level radioactive waste	5,116 m^3	2.338 million m^3

Source: *Inventory of Radioactive Waste in Canada*, Low Level Radioactive Waste Management Office (LLRWMO), March 2012.

TABLE 3

Waste inventory projections to end of 2011 and 2050

Waste category	Waste inventory to end of 2011	Waste inventory to the end of 2050
Nuclear fuel waste	9,400 m^3	20,000 m^3
Intermediate-level radioactive waste	34,400 m^3	67,000 m^3
Low-level radioactive waste	2.34 million m^3	2.59 million m^3

Source: *Inventory of Radioactive Waste in Canada*, LLRWMO, March 2012.

NUCLEAR LEGACY SITES

Legacy sites consist of outdated and unused research facilities and buildings, a wide variety of buried and stored radioactive waste, and affected lands. They are the result of more than 60 years of nuclear research and development by the National Research Council of Canada and AECL. CNSC staff perform periodic inspections to evaluate if these sites and their safety documentation comply with regulatory and environmental requirements, as well as with criteria for quality assurance, security, emergency preparedness and other protective measures.

Spotlight Story

Technical and Research Support to the Deep Geologic Repository Joint Review Panel

In January 2012, the Honourable Peter Kent, Canada's Minister of the Environment and CNSC President Michael Binder, announced the panel of experts that would review OPG's plan to build and operate a facility for storing radioactive waste in Ontario.

OPG has proposed the DGR project to store low- and intermediate-level radioactive waste over the long term. The three-member Joint Review Panel that will review the project is chaired by Dr. Stella Swanson, and also includes Dr. James F. Archibald and Dr. Gunter Muecke.

WHAT ARE LOW- AND INTERMEDIATE- LEVEL WASTES?

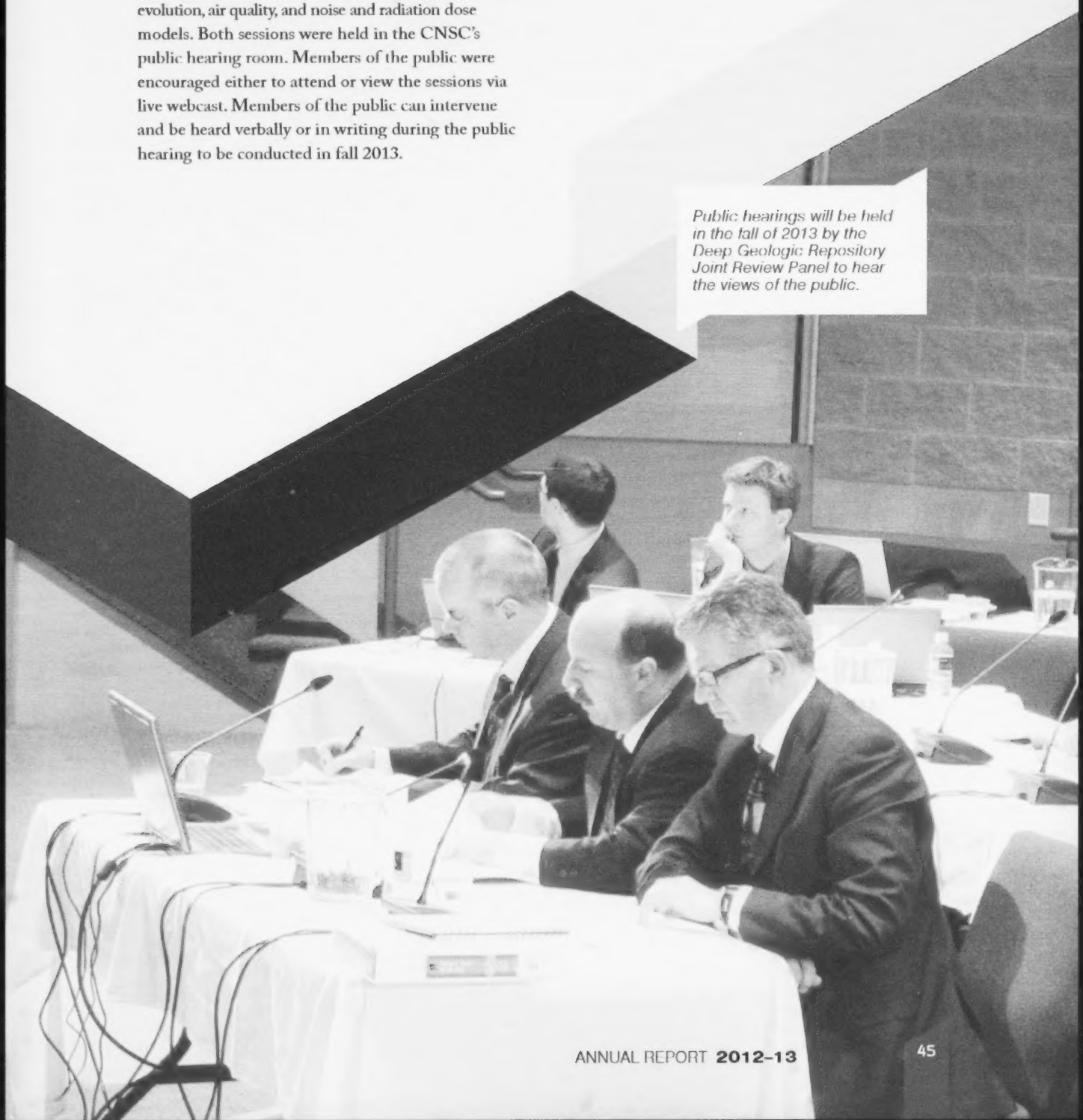
Low-level waste consists of industrial items that have become contaminated with low levels of radioactivity during the operation, refurbishment and decommissioning of nuclear generating stations. Intermediate level radioactive waste is primarily comprised of used nuclear reactor components, ion-exchange resins, and filters used to purify reactor systems.

THE CNSC PROVIDES KEY RESEARCH

The proposed project must meet stringent rules under the CEAA 2012 as well as the NSCA before the proponent can obtain a licence to build and operate. The CNSC has been providing technical and research assistance as the Joint Review Panel conducts its complex work. In 2012–13, the panel submitted 543 information requests to OPG on topics as diverse as methods used for measuring radionuclide levels, the types of aquatic species near the site and possible effects that the project could have on them, and the effectiveness of grout injection in bedrock for restricting the flow of water.

THE PUBLIC IS WELCOME TO PARTICIPATE

To prepare for a series of public hearings and engagement with Aboriginal communities in 2013, the panel hosted two technical information sessions in 2012. The sessions gathered information from OPG and the CNSC about site preparation, construction and operational activities as well as information about hydrogeology, repository evolution, air quality, and noise and radiation dose models. Both sessions were held in the CNSC's public hearing room. Members of the public were encouraged either to attend or view the sessions via live webcast. Members of the public can intervene and be heard verbally or in writing during the public hearing to be conducted in fall 2013.



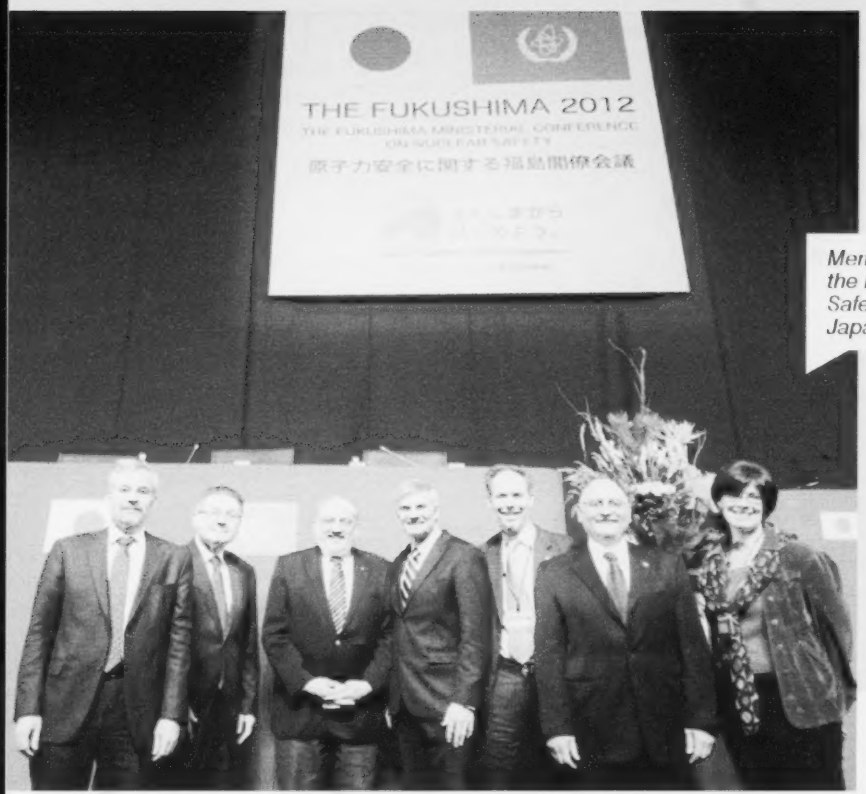
Public hearings will be held in the fall of 2013 by the Deep Geologic Repository Joint Review Panel to hear the views of the public.

CNSC Executive Vice-President Ramzi Jammal (right) and Director General Jason Cameron (left), attend a briefing prior to visiting the Fukushima Daiichi nuclear power plant in December 2012.

NATIONAL SECURITY AND INTERNATIONAL COMMITMENTS

WE LEAD INTERNATIONALLY

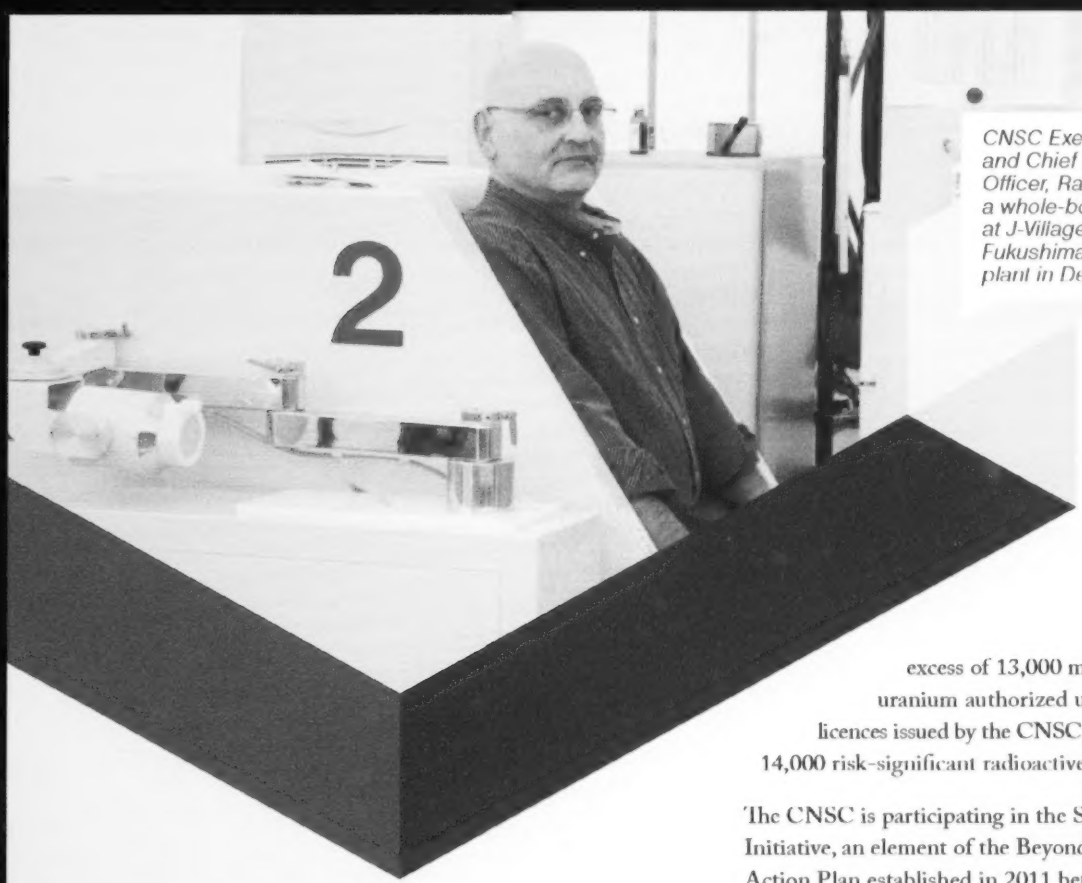
Canada is a world leader in promoting the peaceful use of nuclear energy. To fulfill Canada's international obligations, the CNSC supports and implements our country's international agreements in the area of nuclear safety, non-proliferation and security.



Members of the Canadian delegation to the IAEA Ministerial Meeting on Nuclear Safety, held in Fukushima Prefecture, Japan in December 2012.

NATIONAL SECURITY AND INTERNATIONAL COOPERATION SUMMED UP

- As of 2012–13, 28 nuclear cooperation agreements were in place between Canada and other countries.
- Canada and China signed an additional protocol to their existing bilateral nuclear cooperation agreement which will facilitate greater cooperation in the transfer of uranium ore concentrates for peaceful use in civilian nuclear power programs in China.
- The CNSC and the China Atomic Energy Authority signed a supplementary administrative arrangement pursuant to the protocol agreement. Both the protocol agreement and the administrative arrangements came into force early in 2013.
- The CNSC and India's Department of Atomic Energy signed an appropriate arrangement in March 2013 towards full implementation of the nuclear cooperation agreement signed by Canada and India in 2010 (see spotlight story on page 50).
- The CNSC signed a new bilateral administrative arrangement with the Radiological Protection Institute of Ireland to harmonize regulatory controls on the import and export of radioactive sources, pursuant to the IAEA *Code of Conduct on the Safety and Security of Radioactive Sources*.
- The CNSC and the Ministry of Foreign Affairs of the United Arab Emirates (UAE) signed an administrative arrangement in September 2012 pursuant to the nuclear cooperation agreement signed by Canada and the UAE in 2012.
- The CNSC also signed two amended memoranda of understanding for technical cooperation and exchange of information with the United States Nuclear Regulatory Commission and the Nuclear Safety and Security Commission of the Republic of Korea.
- The CNSC's Executive Vice-President and Chief Regulatory Officer chaired a session on strengthening nuclear safety including emergency preparedness and response, at the International Atomic Energy Agency's Fukushima Ministerial Conference on Nuclear Safety that was held in December 2012 in Fukushima Prefecture, Japan.



CNSC Executive Vice-President and Chief Regulatory Operation Officer, Ramzi Jammal, undergoing a whole-body measurement at J-Village before visiting the Fukushima Daiichi nuclear power plant in December 2012.

NON-PROLIFERATION AND IMPORT/EXPORT CONTROLS

The major elements of Canada's nuclear non-proliferation policy involve international non-proliferation, export control, safeguards and security commitments. As of 2012–13, 28 nuclear cooperation agreements were in place between Canada and other countries, and more are on the horizon. The CNSC provides technical expertise to the Department of Foreign Affairs, Trade and Development Canada in the negotiation of these agreements, and is responsible for implementing the agreements through administrative arrangements negotiated with its regulatory counterparts.

The CNSC works to ensure that Canada's nuclear exports are used for peaceful purposes only. The CNSC also works hard to promote a stronger system for the safe and secure use of nuclear substances internationally.

In 2012–13, the CNSC issued 793 export and 135 import licences for nuclear substances, equipment and information controlled pursuant to the NSCA. Of this number, 202 of the export licences were issued for radioactive sealed sources that carried significant risk. Canadian companies exported in excess of 13,000 metric tons of uranium authorized under export licences issued by the CNSC, and just under 14,000 risk-significant radioactive sources.

The CNSC is participating in the Single Window Initiative, an element of the Beyond the Border Action Plan established in 2011 between the governments of Canada and the United States to enhance border security and economic competitiveness. This initiative is aimed at establishing more streamlined and integrated border processes for situations that involve regulatory import admissibility and compliance decisions.

SAFEGUARDS

As Canada's designated safeguards authority, the CNSC is responsible for managing Canada's safeguards agreements with the IAEA. The ultimate goal of the CNSC's safeguards program is to assure both Canadians and the international community that all nuclear material in the country – such as uranium, plutonium, and thorium – is used for peaceful activities and is not diverted for use in a weapons program.

Electronic reporting

Part of the CNSC's safeguards responsibilities involves keeping track of nuclear material inventories and their movements within the country. The CNSC requires licensees to submit nuclear materials accountancy information and is currently engaged in a project to enable licensees to submit such information in a secure, electronic format. This project will permit licensees to

upload accountancy data to the CNSC's Nuclear Material Accounting System through the CNSC online portal. The estimated timeframe for completion for this project is fall 2013.

EMERGENCY MANAGEMENT

The CNSC is leading various initiatives to learn from the accident at TEPCO's Fukushima Daiichi nuclear power plant in Japan in March 2011. Several activities will help us improve our regulatory response and ensure we continue to work in harmony with all levels of government and facility operators to protect the health, safety and security of Canadians as well as the environment.

Major revision of the Federal Nuclear Emergency Plan

Over the last year, Health Canada has been working on revising its Federal Nuclear Emergency Plan. Health Canada met with its stakeholders, including the CNSC to discuss the overall approach and how the plan can be improved.

The plan is now an Annex to the Federal Emergency Response Plan led by Public Safety Canada and was endorsed at the Deputy Ministers Emergency Management Committee in October 2012.

Bruce Power exercise

In October 2012, Bruce Power and Emergency Management Ontario (EMO) led the Huron Challenge exercise to test Ontario's ability to respond to a major natural disaster.

The simulated event was based on severe weather events (tornados) at three areas within the Bruce Peninsula. Offsite organizations worked with Bruce Power and other organizations to effectively manage the response.

For this exercise, the CNSC activated its Emergency Operations Centre in Ottawa and provided staff to Bruce Power as well as to EMO's Provincial Emergency Operations Centre in Toronto.

Government agencies exercise

The wide-ranging impacts of the events at the Fukushima Daiichi nuclear power plant in Japan highlighted the importance of nuclear safety around the world, and highlighted awareness of Canada's high level of preparedness in case of a serious incident at a Canadian nuclear power plant.

In June 2012, senior officials from Natural Resources Canada (NRCan), the CNSC and AECL participated in a tabletop exercise to test and validate the NRCan Emergency Management Plan for nuclear and radiological incidents including the integrated emergency response within its portfolio agencies.

NUCLEAR SECURITY

Performance Testing Program at high-security facilities

The CNSC has commenced the third cycle of its Performance Testing Program (PTP) at high-security nuclear facilities, including nuclear power plants and AECL's Chalk River Laboratories.

The PTP is an effective means of assisting in testing, assessing and validating a licensee's physical protection systems to confirm if they are adequate and comply with performance and regulatory requirements. This program is applied to high security sites in addition to the more traditional regulatory oversight of all licensed sites.

The CNSC continues to utilize the Canadian Adversary Testing Team (CATT) during these performance-testing exercises to play the role of a credible adversary in safe, realistic and challenging scenarios. These exercises are evaluated, the results serving as a means to continually develop and improve the physical protection at Canadian high-security nuclear facilities so that they meet regulatory requirements. There are currently 18 CATT volunteers drawn from six nuclear response forces for high-security sites. Licensees have demonstrated they are addressing lessons learned from the performance testing security validation exercises.

Oversight of security performance at other licensed facilities

CNSC staff continued their other oversight roles, performing inspections, surveillance activities and technical assessments for other licensed sites. The CNSC is currently developing regulatory documents that support requirements and recommendations to enhance security at all sites and across all activities.

In March 2013, the appropriate arrangement was signed in Ottawa by Michael Binder, President of the Canadian Nuclear Safety Commission (left), in the presence of Admiral Nirmal Kumar Verma, High Commissioner of India to Canada (right).

Spotlight Story

Canadian and Indian Regulators Sign Arrangement to Ensure the Peaceful Use of Nuclear Energy Material

In 2012, the CNSC and India's Department of Atomic Energy finalized negotiations on an arrangement to cooperate on the peaceful use of nuclear energy, opening the way for the two countries to engage in nuclear trade.

The appropriate arrangement is the next step in implementing a nuclear cooperation agreement (NCA) between the two countries, which Canada and India signed in 2010. Once in effect, it will enable Canadian firms to export and import controlled nuclear materials, equipment and technology to and from India to facilities that fall under the International Atomic Energy Agency's safeguard system.

TREATY-LEVEL ASSURANCE

NCAs provide bilateral international treaty-level assurance that nuclear material, equipment and technology coming from Canada will be used only in civilian and peaceful applications.

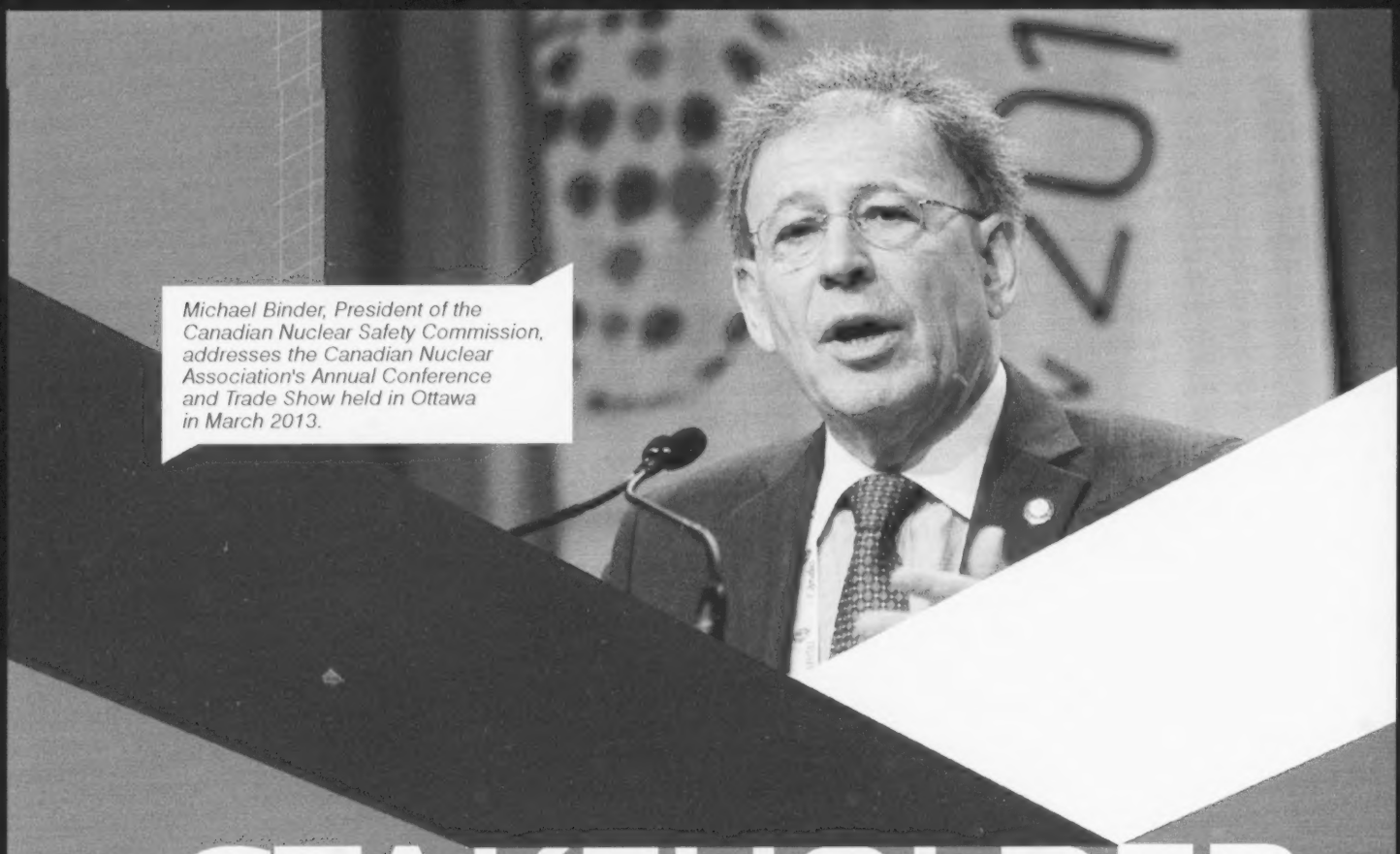
The agreement between Canada and India, when in force, will provide for members of Canada's nuclear industry access to India's expanding nuclear market and will facilitate the exploration of joint commercial ventures in research and development. Nuclear energy production in Canada generates about $5 billion in annual revenues. Canada's nuclear industry employs 30,000 people and exports one billion dollars a year of uranium.

NEW JOINT COMMITTEE

The agreement also establishes a new Joint Committee between Canada and India to ensure the two countries will continue to discuss and share information regarding the peaceful use of nuclear energy. The committee will build on Canada and India's existing relationship for sharing expertise in areas such as research and development, safety and next-generation nuclear facilities.

TIGHT REGULATIONS ON NUCLEAR EXPORTS

The Government of Canada tightly regulates the export of nuclear items to ensure that such items are exported only to countries that meet Canada's stringent non-proliferation and security requirements.



Michael Binder, President of the Canadian Nuclear Safety Commission, addresses the Canadian Nuclear Association's Annual Conference and Trade Show held in Ottawa in March 2013.

STAKEHOLDER RELATIONS

REACHING OUT TO CANADIANS

CNSC staff travel from coast to coast, visiting Canadians in their communities and answering their questions on how we regulate nuclear safety. This ongoing dialogue is important for increasing public understanding and trust in our role of protecting Canadians, their health and the environment. We have also made efforts to make our information more accessible by adopting several innovations in electronic media.

ENGAGING WITH CANADA'S ABORIGINAL COMMUNITIES

The CNSC has a legislated mandate to communicate with the public on our regulatory activities. We also understand the importance of building relationships with Canada's Aboriginal peoples and have engaged with groups about licensing reviews in numerous locales: Bruce County and Manitoulin Island on the proposed DGR; in the Durham region on the refurbishment of the Darlington Nuclear Generating Station; and throughout northern Saskatchewan about a number of mines. To bring public hearings closer to potentially affected communities, we held hearings in Mistissini and Chibougamau, Québec on the proposed Matoush uranium exploration project.

FUNDING ENCOURAGES PUBLIC PARTICIPATION

The CNSC has continued to administer its Participant Funding Program that was established in 2011 to facilitate the public, Aboriginal Peoples and other stakeholders' participation in hearings of environmental protection and licensing for major nuclear facilities. Funding may also be made available for other CNSC proceedings that are of interest to the public or to Aboriginal peoples. This year, $92,376 in funding was distributed to six recipients to attend public hearings on the Darlington refurbishment. Funding plans for 2013–14 already include 22 successful applications for four public hearings.

IMPROVING OUR CONSULTATION PRACTICES

The CNSC has formalized its engagement practices and adopted standard consultation periods. Meetings were held with stakeholders to discuss specific feedback on consultations.

We are increasingly making use of discussion papers, with four published this year. The CNSC's Regulatory Framework Plan was published in January and is updated quarterly.

STRENGTHENING PUBLIC INFORMATION AND DISCLOSURE FOR LOCAL COMMUNITIES

In 2012–13, we implemented new requirements for many licensees to enhance their public information and disclosure with local communities and the public. These new expectations are contained RD/GD 99.3, *Requirements and Guidance for Public Information and Disclosure* and apply to power reactor licensees, Class I nuclear facilities, uranium mines and mills and certain Class II nuclear facilities (see spotlight story on page 25).

ENGAGING WITH STAKEHOLDERS

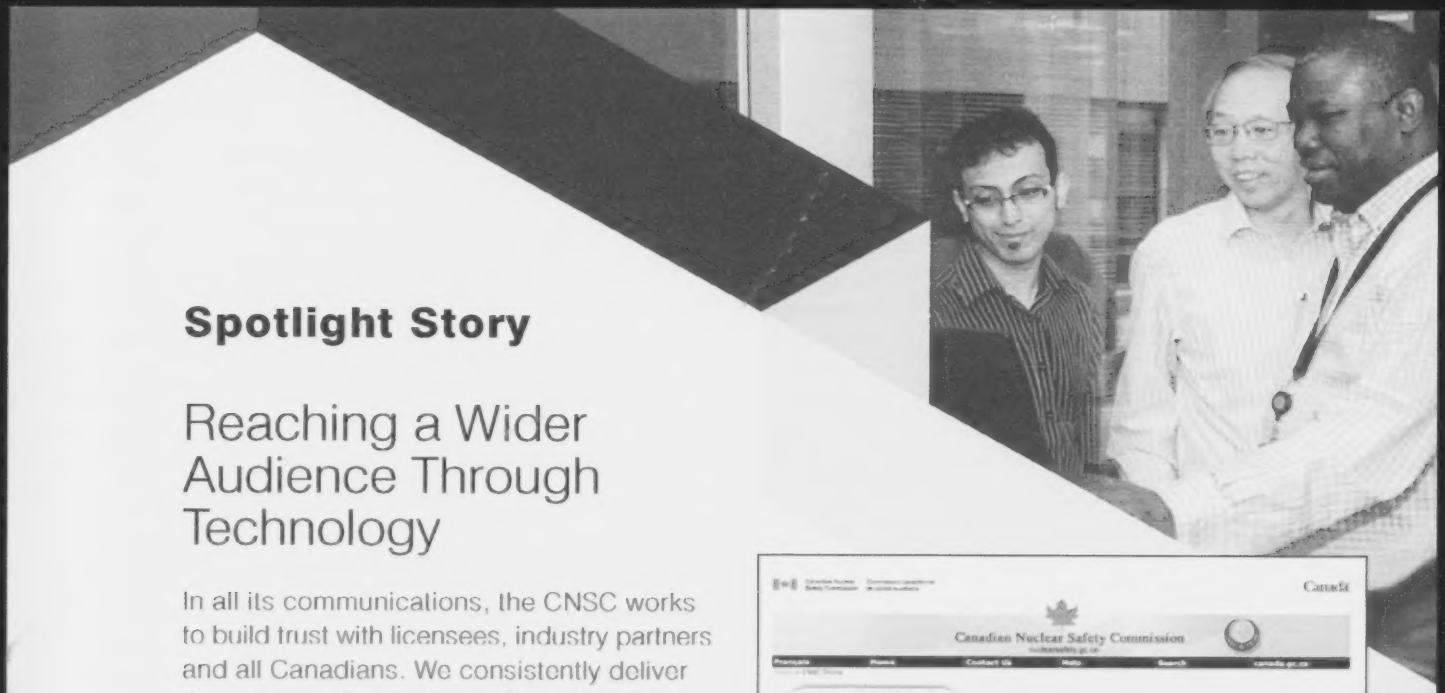
The CNSC partnered with the Canada Science and Technology Museum on a multiple-year exhibit, "Let's Talk Energy – Engaging Ideas for Canada's Future", and also participated as an exhibitor or participant at many conferences and events. In addition, CNSC staff frequently reach out to communities, organizations and Aboriginal peoples to discuss new, ongoing or potential nuclear projects and initiatives to share information and encourage public participation. Our objective is to communicate with Canadians about our mandate and our work in ensuring that Canada's nuclear sector is safe.

CNSC 101, our traveling information and educational program, taught audiences in six locales how we provide oversight to ensure a safe and secure nuclear sector and its activities.

The CNSC is committed to advancing the regulatory strategy for radiography, and promotes a strong safety culture in the industrial radiography community. The CNSC regularly conducts radiography outreach across Canada in order to communicate openly with stakeholders and ensure a safe environment for workers and the public.

COMMUNICATING THROUGH ALL CHANNELS

In 2012, the CNSC launched several new social media projects, including English and French Facebook pages to make information about nuclear safety more accessible. Also launched were the CNSC YouTube channel, which will provide a mix of CNSC and third-party video content, and CNSC Online, a new Web-based information tool (see spotlight story on page 53).



Spotlight Story

Reaching a Wider Audience Through Technology

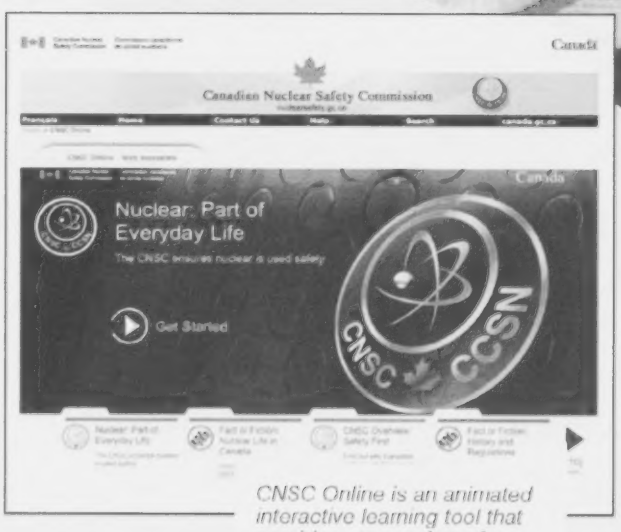
In all its communications, the CNSC works to build trust with licensees, industry partners and all Canadians. We consistently deliver the message that nuclear in Canada is safe – a message that is especially important in communities that host nuclear facilities and uranium mining and milling activities.

For those who are uninformed about the nuclear industry or who wish to share their concerns with us, we encourage an open and transparent exchange of information at all times.

COMMUNICATING ONLINE

The CNSC was an early adopter of online communications, with public hearings available through web streaming since the mid-2000s. Webcasts are also provided when the Commission travels to communities to hear public interventions about nuclear-related projects. Examples from 2012 include two days of hearings in northern Québec about the Matoush uranium mine project, and four days in Northumberland County, Ontario, to consider 212 written interventions from the public. These included 90 oral presentations about the Darlington Nuclear Generating Station and Darlington Waste Management Facility.

In 2012–13, we expanded our communications online by reaching out via Facebook, YouTube and webinars, by adding information to our web site and expanding our list of email subscribers, and by continuing to produce and release content for CNSC Online, an interactive presentation that explains virtually all aspects of our work.



CNSC Online is an animated interactive learning tool that provides an overview of nuclear in Canada, focusing on the CNSC's role in ensuring safety.

IN 2012–13, THE CNSC HAD:

527,382 Web site visits

450 Facebook friends

1,000 YouTube views

2,342 email subscribers

1,600 public enquiries

COMMISSION MEMBERS

INDEPENDENT AND TRANSPARENT DECISION MAKING

Mr. Michael Binder

President and Chief Executive Officer, Canadian Nuclear Safety Commission

Ottawa, Ontario
Named as a permanent member on January 15, 2008

Dr. Ronald J. Barriault

Physician, Restigouche Regional Health Authority

Charlo, New Brunswick
Named as a permanent member on December 3, 2007

Mr. André Harvey

Québec City, Québec
Named as a permanent member on June 2, 2006

Dr. J. Moyra J. McDill

Professor Emeritus, Department of Mechanical and Aerospace Engineering, Carleton University

Ottawa, Ontario
Named as a permanent member on May 30, 2002

Dr. Alexander (Sandy) McEwan

Professor and Chair, University of Alberta Cross Cancer Institute

Edmonton, Alberta
Named as a permanent member on March 7, 2013

Mr. Dan Tolgyesi

President, Québec Mining Association

Québec City, Québec
Named as a permanent member on May 30, 2008

Ms. Rumina Velshi

Toronto, Ontario

Named as a permanent member on December 15, 2011

Dr. James Archibald

Professor of mining engineering, Queen's University, Ontario

Named as a temporary member on December 1, 2011 to the Deep Geologic Repository for Low- and Intermediate-Level Radioactive Waste Joint Review Panel

Dr. Gunter Muecke

Professional geologist

Named as a temporary member on December 1, 2011 to the Deep Geologic Repository for Low-and Intermediate-Level Radioactive Waste Joint Review Panel

Dr. Stella Swanson

Environmental consultant

Named as a temporary member on December 1, 2011, currently Chair of the Deep Geologic Repository for Low- and Intermediate-Level Radioactive Waste Joint Review Panel

Ms. Jocelyne Beaudet

Lunenberg, Nova Scotia

Named as a temporary member on October 22, 2009 to the Darlington Joint Review Panel

Mr. Alan R. Graham

Rexton, New Brunswick

Named as a temporary member on October 22, 2009, as Chair of the Darlington Joint Review Panel

Mr. Ken Pereira

Ottawa, Ontario

Named as a temporary member on October 22, 2009 to the Darlington Joint Review Panel

The CNSC's Commission is central to the functioning of the CNSC. The Commission makes independent, fair and transparent decisions on the licensing of major nuclear-related activities. It also establishes legally binding regulations and sets regulatory policy on matters related to the protection of health, safety, security and the environment and to the implementation of international obligations respecting peaceful uses of nuclear energy.

Before the Commission makes decisions about whether to license nuclear-related activities, it considers applicants' proposals, recommendations from CNSC staff, and stakeholder views. Each decision to license is based on information that demonstrates that the activity or the operation of a given facility can be carried out safely and that the environment is protected. To promote openness and transparency, the Commission conducts its business where possible in public hearings and meetings and, where appropriate, in communities affected by its decisions. Aboriginal people and other members of the public can participate in public hearings via written submissions and oral presentations.

Commission hearings and meetings can also be viewed online as webcasts at nuclearsafety.gc.ca. Transcripts of public hearings and meetings are also available.

The Commission currently has seven permanent members, appointed by the Governor in Council and chosen according to their credentials. All are independent of political, governmental, special interest group or industry influences. Temporary members can be appointed whenever necessary. The President of the CNSC is the only full-time Commission member.

Under amendments to the NSCA enacted as part of the Government of Canada's Responsible Resource Development initiative passed in 2012, the maximum term of temporary Commission members has been extended from six months to three years. This will align the terms more closely with the expected timelines for regulatory licensing reviews and environmental assessments for major projects.

MANAGEMENT DISCUSSION AND ANALYSIS

CANADIAN NUCLEAR SAFETY COMMISSION

Financial Statements for the Year Ending March 31, 2013

The review of the financial position and operating results of the Canadian Nuclear Safety Commission (CNSC) should be read in conjunction with the audited financial statements that follow. The audited Statement of Operations and Net Financial Position include the planned results for 2012–13 as set out in the Future Oriented Financial Statements published with the *2012–13 Report on Plans and Priorities*.

PURPOSE

The purpose of the CNSC Management Discussion and Analysis (MD&A) is to provide management with the opportunity to explain, in narrative form, the CNSC's current financial situation and any significant variances between planned and actual results, as well as to provide a prospective analysis. It is aimed at giving the reader the ability to look at CNSC's operations through the eyes of management.

RESULTS OF OPERATIONS

The CNSC expenses totalled $156.0 million in 2012–13, up from $148.8 million a year earlier, for a total increase of $7.2 million or 4.8%. A total of $109.8 million of expenses were paid for by licence fee revenues, while the balance of $46.2 million, the CNSC net cost of operations, was funded through parliamentary appropriations.

Revenues

In 2008–09, CNSC received authority to spend the revenues it collects through the conduct of regulatory oversight of its fee-paying licensees, and for the conduct of special projects such as nuclear power reactor vendor design reviews. CNSC collects regulatory fees in accordance with the *CNSC Cost Recovery Fees Regulations*. The CNSC funds approximately 70% of its total cost of operations from fees collected from licensees.

Revenues totalled $109.8 million in 2012–13, up $5.1 million (4.9%) from $104.7 million in 2011–12. The increase in fee revenues is the result of:

- Increased licensing activity associated with radioactive waste facilities, more specifically the deep geological repository for low and medium radioactive nuclear waste
- Increased licensing and compliance activity for nuclear power reactors and for nuclear substance processing facilities
- Increased efforts deployed to the conduct of nuclear power reactor vendor design reviews
- Decreased regulatory activity related to nuclear research and test establishment, uranium processing facilities and waste nuclear substances

PARLIAMENTARY APPROPRIATIONS

Net Cost of Operations

Parliamentary appropriations are used to fund some activities and certain type of licensees which are, by regulation, not subject to cost recovery. The regulations state that some licensees, such as hospitals and universities, are exempt from paying fees as these entities exist for the public good. In addition, fees are not charged for activities that result from CNSC obligations that do not provide a direct benefit to identifiable licensees. These include activities with respect to Canada's international obligations (including the non-proliferation activities), public responsibilities such as emergency management and public

information programs, and updating of the NSCA and associated regulations as appropriate.

In 2012 Parliament confirmed that it was in the interest of Canadians to continue to have the above activities funded by the public. Parliament renewed on a permanent basis, CNSC funding for fee-exempt licensees and other activities not subject to cost recovery.

In 2012–13 the CNSC net cost of operations funded by Parliamentary appropriation was $46.2 million, for an increase of $2.2 million over the previous year total.

Government funding and transfers

The variance from the Planned results 2013 in Net cash provided by the Government is attributable to the permanent renewal of $8.0 million in funds associated to the fee-exempt licensees category, and the government-wide initiative known as Single Window Initiative announced in the Federal Budget 2013.

Expenses

On an annual basis, the CNSC conducts a planning exercise and approves operating budget levels prior to the start of the fiscal year. Budget approval takes into account the expected revenues from planned regulatory oversight activities that are subject to cost recovery and the available parliamentary funding.

Total CNSC expenses edged up to $156 million in 2012–13 from $148.8 million in 2011–12, for a net increase of $7.2 million (4.8%). The increase in total expenses was mainly caused by:

- an increase in employee salary adjustments resulting from the latest settlement of the collective agreement (arbitral decision dated December 10, 2012) which retroactively increased employees' salaries and wages to April 1, 2011
- an increase in the cost of employee future benefits, and
- an increase in overall professional services related to informatics and technology as a result of an acceleration in investments in the area of information systems for compliance reporting as well as investments to meet new government standards related to CNSC Web site accessibility

OUTLOOK

The outlook for CNSC regulatory oversight requirements remains strong, considering Canada's aging fleet of nuclear power reactors and consideration being given by the Province of Ontario to the construction of new nuclear power reactors and deep geological repositories.

While the impact of the decommissioning of the Gentilly-2 nuclear power reactor is leading CNSC to conduct workforce and regulatory activity realignments, licence fee revenues are currently projected to stabilize at around $111 million for 2013–14 and 2014–15.

The total projected expenses for 2013–14 are $159.7 million, up $3.7 million from the $156 million spent in 2012–13. Increases in salaries and employee benefit costs, investments in financial systems and the conduct of several public hearings related to the review of licence application and the renewal of licenses explain, for the most part, the growth in total projected expenses in 2013–14.

Over the next two to three years, CNSC expects decisions regarding the life extension of some nuclear power and research reactors, the construction of new nuclear power reactors and the creation of deep geological repositories. These decisions will have a material impact on CNSC's workload. CNSC continues to prepare for changes in the industry through improvements to its funding regime and skills development programs.

CNSC MANAGEMENT TEAM

BACK

Terry Jamieson
Vice-President, Technical Support

Michel Cavallin
Vice-President, Corporate Services, and Chief Financial Officer

Gordon White
Vice-President, Regulatory Affairs, and Chief Communications Officer

Marc Leblanc
Commission Secretary

FRONT

Jacques Lavoie
Senior General Counsel and Director of Legal Services

Michael Binder
President and Chief Executive Officer

Ramzi Jammal
Executive Vice-President, Regulatory Operations, and Chief Regulatory Operations Officer

ANNEX

ANNEX A

COMMISSION HEARINGS AND OPPORTUNITIES TO BE HEARD

HEARINGS

NUCLEAR POWER PLANTS

New Brunswick Power Nuclear Corporation:

- Decision to amend the Point Lepreau Nuclear Generating Station power reactor operating licence – Abridged hearing (December 20, 2012)

Ontario Power Generation Inc.:

- Decision to issue a licence to prepare site for a new nuclear power plant at the Darlington nuclear site – Public hearing (March 21, 2011 to April 8, 2011)
- Decision to amend the Darlington Nuclear Generating Station power reactor operating licence to reflect updates in documentation – Abridged hearing (April 24, 2012)
- Decision to amend the Pickering Nuclear Generating Station A power reactor operating licence to reflect updates in documentation – Abridged hearing (April 24, 2012)
- Decision to amend the Pickering Nuclear Generating Station B power reactor operating licence to reflect updates in documentation – Abridged hearing (April 24, 2012)
- Decision to amend the nuclear power reactor operating licence for the Pickering Nuclear Generating Station B to adopt a new licence format and licence conditions handbook – Abridged hearing (June 22, 2012)
- Decision to amend the Pickering Nuclear Generating Station A power reactor operating licence – Abridged hearing (June 22, 2012)
- Decision to renew the Darlington Waste Management Facility operating licence for a six-month period – Abridged hearing (July 4, 2012)
- Decision to accept the financial guarantee and to amend the licence for the future decommissioning of its nuclear facilities – Public hearing (October 24, 2012)
- Decision to renew the Darlington Waste Management Facility operating licence for a period of 10 years – Public hearing (December 3–6, 2012)
- Decision to renew the power reactor operating licence for the Darlington Nuclear Generating Station – Public hearing (December 3–6, 2012)
- Decision to accept the environmental assessment screening report regarding the proposal to refurbish and continue to operate the Darlington Nuclear Station in the Municipality of Clarington – Public hearing (December 3–6, 2012)
- Decision to amend power reactor operating licences for the Pickering Nuclear Generating Stations A and B to incorporate revisions of derived release limits and minimum shift complement – Abridged hearing (December 28, 2012)

Royal Military College of Canada:

- Decision to amend the SLOWPOKE-2 facility non power reactor operating licence – Abridged hearing (December 27, 2012)

Shield Source Inc.:

- Decision to amend, under section 25 of the NSCA, the nuclear substance processing facility operating licence – Abridged hearing (May 2, 2012)
- Decision to renew the nuclear substance processing facility operating licence for a twelve-month period – Abridged hearing (December 27, 2012)

URANIUM MINES AND MILLS

AREVA Resources Canada Inc.:

- Decision to accept the *Environmental Assessment Screening Report for the Receipt and Processing of McArthur River Ore Slurry at the McClean Lake Operation* – Abridged hearing (April 19, 2012)
- Decision to accept the *Comprehensive Study Report for the Proposed Midwest Mining and Milling Project in Northern Saskatchewan* – Abridged hearing (May 11, 2012)
- Decision to amend the uranium mine operating licence for the McClean Lake Operation – Public hearing (October 24, 2012)

Cameco Corporation:

- Decision to accept the *Proposed Project-Specific Guidelines Scoping Document for the Preparation of an Environmental Impact Statement for the Proposed Rabbit Lake Tailings North Pit Expansion Project Extension Project* – Abridged hearing (May 24, 2012)
- *Decision to accept the Comprehensive Study Report for Cameco Corporation's Proposed Redevelopment of the Port Hope Conversion Facility* – Abridged hearing (May 30, 2012)
- Decision to renew the Beaverlodge Project waste facility operating licence for a six-month period – Abridged hearing (September 25, 2012)

Strateco Resources Inc.:

- Decision to issue a uranium mine site preparation and construction licence for the Matoush underground exploration project for a period of five years – Public hearing (June 5–7, 2012)

Canadian Nuclear Safety Commission:

- Decision to exempt form licensing the Greyhawk and Agnew Lake closed uranium mines without tailings – Abridged hearing (May 11, 2012)

PROCESSING AND RESEARCH FACILITIES

AECL:

- Decision to approve the decommissioning of the Plutonium Tower at the Chalk River Laboratories – Abridged hearing (September 25, 2012)
- Decision to amend the Nuclear Research and Test Establishment decommissioning licence for Whiteshell Laboratories to reflect administrative updates – Abridged hearing (October 12, 2012)
- Decision to amend the waste nuclear substance licence for its Port Hope Long-Term Low-Level Radioactive Waste Management Project for a period of 10 years – Public hearing (October 24, 2012)
- Decision to accept the request for approval to decommission two facilities at Chalk River Laboratories – Abridged hearing (March 28, 2013)

Canadian Light Source Inc.:

- Decision to renew its particle accelerator operating licence – Public hearing (May 2, 2012)

McMaster University:

- Decision to amend the non-power reactor operating licence – Abridged hearing (August 9, 2012)

TRIUMF Accelerators Inc.:

- Decision to renew the TRIUMF Accelerator Inc.'s Class IB particle accelerator operating licence – Public hearing (May 2, 2012)

MEETINGS

Fukushima:

- Decision to accept the recommendations detailed in the CNSC staff's action plan – Public meeting (May 3, 2012)

IAEA:

- Decision to apply the IAEA *Regulations for the Safe Transport of Radioactive Material*, 2009 Edition – Public meeting (June 21, 2012)

ANNEX B

REGULATORY FRAMEWORK PROJECTS PUBLISHED/ COMPLETED IN 2012–13

REGULATORY AMENDMENTS TO INTRODUCE TIMELINES

In January 2013, amendments to the *Class I Nuclear Facilities Regulations* and the *Uranium Mines and Mills Regulations* were published, establishing 24 month timelines for projects that require the CNSC's regulatory review and a Commission decision, for new applications for the following types of licences:

- a licence to prepare a site for a Class I nuclear facility
- a combined licence to prepare site and construct a uranium mine and mill

The timelines, based on the CNSC's current regulatory review process, provide more predictable timing of regulatory reviews of applications for licences for new nuclear projects, while continuing to protect the health, safety and security of Canadians and the environment. The regulatory review process will continue to include measures to allow the public and Aboriginal groups to participate fully in the regula tory review of projects.

This project also included pre-consultation with stakeholders through a discussion paper (DIS-12-04, Regulated Timelines: Proposed Amendments to the *Class I Nuclear Facilities Regulations* and the *Uranium Mines and Mills Regulations*) published in July, 2012.

DIS-12-03, *FITNESS FOR DUTY: PROPOSALS FOR STRENGTHENING ALCOHOL AND DRUG POLICY, PROGRAMS AND TESTING*

In April 2013, the CNSC published a discussion paper presenting the CNSC's proposals for alcohol and drug policy, programs and testing requirements for Canada's nuclear power plant licensees. The objective of these proposals is to strengthen existing fitness for duty requirements as they relate to sub-stance use.

DIS-12-05, *ADMINISTRATIVE MONETARY PENALTIES*

On June 29, 2012, Bill C-38, the *Jobs, Growth and Long-term Prosperity Act*, received royal assent. The Act made amendments to the NSCA, providing the CNSC with the authority to establish an administra-tive monetary penalties system through regulations.

In August 2012, the CNSC published a discussion paper proposing new Administrative Monetary Penalties Regulations that would establish:

- what constitutes a violation
- how the penalty amounts will be calculated
- how required documents will be served to the penalized parties.

DIS-12-06, *PROPOSALS TO AMEND THE PACKAGING AND TRANSPORT OF NUCLEAR SUBSTANCES REGULATIONS*

In August 2012, the CNSC published a Discussion paper presenting proposed amendments to the *Packaging and Transport of Nuclear Substances Regulations* to update the regulations to reflect changes to international standards for the safe transport of radioactive materials which are detailed in the IAEA's TS R 1 *Regulations for the Safe Transport of Radioactive Materials.*

DIS-12-07, *SAFETY CULTURE FOR NUCLEAR LICENSEES*

In September, 2012, the CNSC published a discussion paper, *Safety Culture for Nuclear Licensees.* This paper presented the CNSC's proposed approach for regulating safety culture in the Canadian nuclear industry, highlighting its importance, as well as what has been done both internationally and in Canada to promote it.

GD-385, *PRE-LICENSING REVIEW OF A VENDOR'S REACTOR DESIGN*

Guidance document GD 385 was published in May 2012 and describes the pre-licensing review process provided by the Canadian CNSC for assessing a vendor's design for a nuclear power plant or small reactor. The review considers the areas of design that relate to reactor safety, security and safeguards.

RD/GD-289, VERSION 2, *LICENCE APPLICATION GUIDE, CLASS II NON-RADIOTHERAPY ACCELERATOR FACILITIES*

Published in May 2012, RD/GD-289 provides interested applicants with information on how to complete and submit an application for a licence for Class II non-radiotherapy accelerator facilities, in accordance with the NSCA and the regulations made therein.

RD/GD-98, *RELIABILITY PROGRAMS FOR NUCLEAR POWER PLANTS*

In June 2012, RD/GD 98 was amended to provide guidance for the development and implementation of a reliability program for a nuclear power plant in Canada. The reliability program assures that the systems important to safety (SIS) shall meet their defined design, and performance criteria at acceptable levels of reliability throughout the lifetime of the facility.

RD/GD-210, *MAINTENANCE PROGRAMS FOR NUCLEAR POWER PLANTS*

Published in December 2012, RD/GD-210 sets out the requirements of the CNSC with regard to maintenance programs for nuclear power plants. Such maintenance programs consist of policies, processes and procedures that provide direction for maintaining structures, systems or components of the plant.

ANNEX C

CNSC ORDERS ISSUED TO LICENSEES IN 2012–13

1 DATE ISSUED: **APR 12, 2012**
DATE RESOLVED: **MAR 7, 2013**
LICENSEE: **SAI TESTING & INSPECTION LTD.**

ISSUE: The order prohibited SAI Testing & Inspection Ltd. from using nuclear gauges. The company was required to place all portable gauges in storage until it could demonstrate that effective training has been provided to staff and workers, and that all items of non-compliance identified during a CNSC inspection had been corrected.

2 DATE ISSUED: **APR 19, 2012**
DATE RESOLVED: **JUL 23, 2012**
LICENSEE: **BUFFALO INSPECTION SERVICES (2005)**

ISSUE: The order required the company to prohibit a certified exposure device operator (CEDO) from operating an exposure device until it could demonstrate to the CNSC that the CEDO's activities no longer pose unreasonable health and safety risks.

3 DATE ISSUED: **JUN 29, 2012**
DATE RESOLVED: **AUGUST 2, 2012**
LICENSEE: **JACK CEWE LTD.**

ISSUE: The order was issued because the company failed to provide the CNSC with a complete application for the renewal of its expired licence. This failure resulted in the company being in possession of an unlicensed radiation device as of July 1, 2012. The order required Jack Cewe Ltd. to immediately transfer its radiation device to an authorized, licensed recipient.

4 DATE ISSUED: **JUL 6, 2012**
DATE RESOLVED: **JUL 26, 2012**
LICENSEE: **BEST THERATRONICS LTD.**

ISSUE: The order required Best Theratronics Ltd. to immediately cease all imports, exports and transfers of all nuclear substances and prescribed equipment until it carried out effective remedial measures to the satisfaction of the CNSC. The order was issued because the company had been conducting unauthorized nuclear activities involving a high-risk radioactive sealed source.

5 DATE ISSUED: **SEP 13, 2012**
DATE RESOLVED: **OCT 29, 2012**
LICENSEE: **CAMECO CORPORATION**

ISSUE: The order was issued due to an inspection following a uranium contamination event at the Blind River Refinery on June 23, 2013 that resulted from opening a pressurized drum containing yellow cake. The order stipulated that Cameco should not open any uranium concentrate drums received from Uranium One Inc. (Willow Creek Facility) until a safe work plan to depressurize the drums had been developed by Cameco and that the plan had been reviewed and deemed safe by a qualified third party, and was satisfactory to the CNSC staff. The basis of the order was to protect workers' health and safety and the environment.

6 DATE ISSUED: **JUL 19, 2012**
DATE RESOLVED: **AUG 1, 2012**
LICENSEE: **SGS CANADA INC.**

ISSUE: The order was issued as a result of observations made during an inspection. The inspection identified non-compliances such as the failure to provide effective radiation safety training to workers, the failure to follow internal radiation protection program procedures, and the use of inadequate labelling for safety purposes.

7 DATE ISSUED: **JUL 27, 2012**
DATE RESOLVED: **AUG 8, 2012**
LICENSEE: **OKANAGAN TESTING LABORATORIES LIMITED**

ISSUE: The order was issued as a result of observations made during inspections conducted on July 26 and July 27, 2012. The inspections identified a failure to follow internal radiation protection program procedures, as well as other non-compliances. The order required Okanagan Testing Laboratories Limited to place all nuclear gauges at its Kelowna location into storage.

8 DATE ISSUED: **AUG 8, 2012**
DATE RESOLVED: **AUG 23, 2012**
LICENSEE: **CT & ASSOCIATES ENGINEERING INC.**

ISSUE: The order was issued as a result of observations made during an inspection. The inspection identified a failure to follow internal radiation protection program procedures, as well as other non-compliances. The order required CT & Associates Engineering Inc. to place all nuclear substances into secure storage. The portable gauges were to remain in storage until the company could demonstrate that management had control over work practices, that an effective radiation protection program had been implemented, and that all items of non-compliance identified during the inspection had been corrected.

9 DATE ISSUED: **AUG 20, 2012**
DATE RESOLVED: **NOV 20, 2012**
LICENSEE: **NELSON'S WELDING INSPECTION LIMITED**

ISSUE: The order required Nelson's Welding Inspection Limited to prohibit a certified exposure device operator (CEDO) from operating an exposure device until the company could demonstrate to the CNSC that the CEDO's activities no longer posed unreasonable health and safety risks.

10 DATE ISSUED: **SEP 5, 2012**
DATE RESOLVED: **OCT 11, 2012**
LICENSEE: **D. CRUPI & SONS LIMITED**

ISSUE: The order was issued as a result of observations made during an inspection. The inspection identified non-compliances such as failing to follow requirements for the transport of portable nuclear gauges. The order required D. Crupi & Sons Limited to place all portable gauges in secure storage until all items of non-compliance identified during the inspection had been corrected.

11 DATE ISSUED: **SEP 11, 2012**
DATE RESOLVED: **OCT 16, 2012**
LICENSEE: **AMEC AMERICAS LIMITED**

ISSUE: The order was issued as a result of observations made during an inspection at the licensee's location in Dartmouth, Nova Scotia. The inspection identified that an untrained worker was using and transporting a portable nuclear gauge at the time of the inspection. The order required AMEC Americas Limited to have the worker stop using the device until the person has been trained and qualified by the company to work with and transport portable nuclear gauges.

12 DATE ISSUED: **SEP 21, 2012**
DATE RESOLVED: **OCT 5, 2012**
LICENSEE: **GROUPE QUALITAS INC.**

ISSUE: The order was issued as a result of observations made during a field inspection in Laval, Québec. The inspection identified that a worker left a portable nuclear gauge unattended on two occasions. The order required Groupe Qualitas Inc. to have the worker immediately stop using the device until the person had been re-trained and qualified by the company to work with portable nuclear gauges. The CNSC required the untrained worker to be removed from duty in order to prevent any risk to the health and safety of the worker, as well as to the public and the environment.

13 DATE ISSUED: **OCT 5, 2012**
DATE RESOLVED: **NOV 16, 2012**
LICENSEE: **HANJIN SHIPPING CANADA INC.**

ISSUE: A shipment from the company triggered a Canada Border Services Agency radiation detection alarm upon its arrival at the Port of Montreal. The order was issued as a result of an inspection at the Port that confirmed kitchenware carried within a shipping container was contaminated with Cobalt-60. Given that Hanjin Shipping Canada Inc. did not hold a CNSC licence to possess nuclear substances, the order required that the company remove the contaminated material it brought into Canada by October 26, 2012.

14 DATE ISSUED: **OCT 15, 2012**
DATE RESOLVED: **APR 9, 2013**
LICENSEE: **ACUREN GROUP INC.**

ISSUE: The order was issued following an unannounced CNSC inspection in Markham, Ontario. During the inspection, workers were observed operating an exposure device in an unsafe manner, without appropriate warning signs or barriers preventing unauthorized access to areas being tested. The order required Acuren Group Inc. to cease radiographic operations at the inspected location and to return the exposure device to secure storage. The operators were also removed from work duties relating to exposure devices, and were not to conduct any further radiography work until safety measures were put in place.

15 DATE ISSUED: **OCT 17, 2012**
DATE RESOLVED: **NOV 16, 2012**
LICENSEE: **INSPEC-SOL INC.**

ISSUE: The order was issued following a field inspection in Kiamika, Quebec. The inspection identified that an employee had left a portable nuclear gauge unattended. The order required Inspec-Sol Inc to have the employee immediately stop using the device until the person has been re-trained and qualified by the company to work with portable nuclear gauges.

16 DATE ISSUED: **NOV 16, 2012**
DATE RESOLVED: **MAY 21, 2013**
LICENSEE: **HNR PROPERTIES LTD.**

ISSUE: The order was issued due to a concern about the imminent demolition of a building in Toronto, Ontario that contained radiological contamination. The building had previously been identified as having radium contamination due to historic activities related radium dial painting or processing. This contamination was fixed to structural elements behind walls within the building and did not present a risk unless the building was demolished without appropriate control measures. The order required that HNR Properties to cease all demolition work until such a time that all measures dealing with the radiological contamination had been completed.

17 DATE ISSUED: **DEC 12, 2012**
DATE RESOLVED: **APR 19, 2013**
LICENSEE: **E2K ENGINEERING LTD.**

ISSUE: The order was issued following a field inspection in Calgary, Alberta, in response to a damaged nuclear gauge. The inspection identified that workers had inadequate training to safely conduct activities licensed by the CNSC and as a result, the CNSC oversaw the safe removal of the damaged gauge. The order required E2K Engineering Ltd. to return all remaining nuclear devices in their possession to secure storage until it had implemented an effective radiation protection program and satisfactorily trained its workers.

18 DATE ISSUED: **JAN 10, 2013**
DATE RESOLVED: **FEB 14, 2013**
LICENSEE: **BONNECHERE EXCAVATING INC.**

ISSUE: The order was issued as a result of observations made during an inspection which identified numerous deficiencies, including inadequate emergency response equipment and a failure to maintain complete training records for workers. The order required Bonnechere Excavating Inc. to stop using its nuclear gauges and to return them to secure storage until it could demonstrate to the CNSC that all items of non-compliance identified during the inspection had been corrected.

19 DATE ISSUED: **JAN 24, 2013**
DATE RESOLVED: **MAR 4, 2013**
LICENSEE: **TISI CANADA INC.**

ISSUE: The order was issued following an unannounced CNSC inspection in Edmonton, Alberta. During the inspection, a worker was observed operating an exposure device in an unsafe manner, without appropriate warning signs or barriers preventing unauthorized access to areas being tested, and not using radiation safety equipment properly. The order required TISI Canada Inc. to remove the worker from duties related to the operation of an exposure device until the worker no longer posed a risk to the health and safety of persons.

20 DATE ISSUED: **JAN 30, 2013**
DATE RESOLVED: **APRIL 23, 2013**
LICENSEE: **HOBAN EQUIPMENT LTD.**

ISSUE: The order was issued as a result of observations made during an inspection that identified numerous deficiencies in the transportation of nuclear devices as well as the company's radiation protection and training programs. The order required Hoban Equipment Ltd. to immediately service the nuclear gauges and place them in secure storage until all items of non-compliance identified during the inspection had been corrected.

21 DATE ISSUED: **FEB 20, 2013**
DATE RESOLVED: **JULY 30, 2013**
LICENSEE: **METALCARE INSPECTION SERVICES INC.**

ISSUE: The order was issued following a CNSC inspection. The inspection revealed that a trainee was operating an exposure device unsafely and without the immediate supervision of an authorized certified exposure device operator. The order required Metalcare Inspection Services Inc. to prohibit the designated supervisor from conducting any licensed activity, including operation of an exposure device, until the company could demonstrate to the CNSC that the supervisor's activities would no longer pose an unreasonable risk to the health and safety of any person.

22 DATE ISSUED: **FEB 25, 2013**
DATE RESOLVED: **APR 2, 2013**
LICENSEE: **LES LABORATOIRES D'ESSAIS MÉQUALTECH INC.**

ISSUE: The order was issued following an unannounced CNSC field inspection at an industrial fabrication facility in Montréal, Québec. Exposure device operators were observed performing radiography work in an unsafe manner, potentially exposing employees of the facility to radiation dose levels above the allowable limits for members of the public. The order required Les Laboratoires d'Essais Méqualtech Inc. to cease all radiography work at the fabrication facility and determine the radiation dose levels of all employees.

23 DATE ISSUED: **MAR 8, 2013**
DATE RESOLVED: **APRIL 11, 2013**
LICENSEE: **DÉMOLISSEURS D'AUTOS NORMAND LEGAULT INC.**

ISSUE: The order was issued following the CNSC review of the licence renewal submission. The review identified that Démolisseurs d'autos Normand Legault Inc. was no longer qualified to continue to safely conduct the licensed activities associated with this device. The order prohibited Démolisseurs d'autos Normand Legault Inc. from using the device, and required the company to safely dispose of it or transfer it to an authorized licensee prior to March 11, 2013.

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Published by Authority of The Honourable Joe Oliver, P.C., M.P., Minister of Natural Resources
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Photo credits: The CNSC would like to thank the following organizations that provided photographs appearing in this document: Accuray Incorporated, Advanced Cyclotron Systems Inc., Atomic Energy of Canada Limited, Bruce Power Inc., Cameco Corporation, Ontario Power Generation Inc., The Ottawa Hospital, and TRIUMF Accelerators Inc.

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CATALOGUE NUMBER: CC171-2013E
ISSN: 1700-8042